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Two Weeks War Against Waste

Whirlwind Campaign Among Employees of Pontiac Plant Brought 3558 Suggestions, a Third of Them of Value and Pointing to Annual Savings of $542,000

A WAR against waste in a whirlwind campaign lasting two weeks was made recently by the Oakland Motor Car Co., Pontiac, Mich. Ammunition employed included forceful speaking by plant executives, posters and display boards galore, a special daily newspaper as well as machine guns, martial music and other means of arousing a waste prevention spirit among the workers and of bringing out suggestions of ways to cut production costs and eliminating waste.

As an incentive, $1,247 in prizes were offered. The intensive campaign brought out 3558 suggestions for stopping waste and improving production methods. When a start was made in checking over the suggestions, it was felt that if 3 per cent of the suggestions proved of tangible value the campaign would have proved successful. However, about 35 per cent of the suggestions were found to be valuable, and these, it is claimed, will result in an annual saving of $542,000.

Numerous other suggestions have not yet been definitely passed on, having been referred to the engineering department to determine whether they are practical. The company spent approximately $16,000 in conducting its war against waste and regards this as a very profitable investment.

The prize money was divided into about 100 individual prizes. A grand prize of $100 was offered the employee who sent in the best suggestion. In addition, the plant was divided into five sectors and 19 prizes aggregating $220 were offered in each sector, ranging from a $50 first prize down to ten sixth prizes of $5 each.

To increase interest in eliminating waste and in the contest, numerous display boards, for which prizes were offered, were placed throughout the plant, illustrating graphically loss due to waste. At the top of the display boards were effective slogans. Posters in color were placed in all departments and for these prizes were given as well as a prize for the best 500-word article on waste elimination.

The campaign against waste was led by Gordon Lefebvre, vice-president in charge of operations and chairman of the Permanent Waste Committee of the Oakland company. Mr. Lefebvre sounded the call to arms in a declaration of war here reproduced.

Extensive preparations were made for the campaign by various committees. A member of the general committee made a trip to Washington to confer with the Department of Commerce officials and to secure suggestions as to the best method of conducting the campaign. Assistance was rendered by the Committee on Elimination of Waste in Industry of the Federated American Engineering Societies, and companies that had conducted similar campaigns were asked to give their experiences and make recommendations.

The intensive campaign continued for two weeks. Noonday meetings were held in the plant cafeteria, during which short talks were made by various executives. Alfred P. Sloan,

Declaration of War

WHEREAS:—There have grown up with this industry, and entrenched themselves firmly within its lawful domains, certain lawless and disturbing elements; and

WHEREAS:—Said elements are in continual and persistent conflict with our march of progress, and

WHEREAS:—Said elements having flourished undisturbed have grown to the point where they now threaten the peace and security of our business, the successful and orderly pursuit of our labors, and have constituted themselves a menace to our future prosperity, and

WHEREAS:—They have established themselves in defiance of all regular and authorized laws governing the conduct of the business of which we are a part

WHEREFORE, BE IT RESOLVED:—*That we, the officers and employees of the Oakland Motor Car Company, this sixth day of May, nineteen hundred twenty-nine, through our regularly constituted representatives in convention duly assembled, do hereby declare war upon the aforesaid offenders—Namely, Extravagance, Inefficiency and Waste; and do pledge all our physical, and such financial resources as may be necessary to wage to successful conclusion this war against them, to the end that we may again be free and undisturbed in the happy pursuit of our labors, and the permanent possession of the benefits which must accrue from a successful prosecution of this war.*

Signed:

G. LEFEBVRE,
General Chairman

Jr., president of the General Motors Corporation, in a letter commending the Oakland company for its campaign, said: "I know that the major items of expense in our corporation are well controlled, but I also feel that there remains a wonderful opportunity in scientifically regulating the minor items. The cumulative total waste of small material items reaches an enormous sum."

At the start of the campaign suggestion blanks were distributed to the workmen. Mr. Lefebvre issued a bulletin in which he listed subjects for consideration in preparing suggestions.

The campaign aroused considerable interest among executives of other General Motors units and a party of the higher executives, including President Sloan and various officers of different units, spent a day visiting the plant and seeing how the campaign was being conducted. These visitors were greatly impressed.

A military demonstration was the feature during another day, when a squad of machine gunners of the 125th Infantry visited the plant and blasted the enemy—Waste—with machine gun fire, bugles and martial music.

The publication of a newspaper, the "Reflector," was one of the effective features of the campaign. This was issued daily for the two weeks, and a few additional issues were published later to announce the results. This four-page paper covered from day to day the various activities in connection with the campaign and contained articles on waste prevention by executives and department heads. It also carried numerous illustrations, including reproductions of photographs taken in the plant showing waste in different departments, photographs of posters and of many of the leaders in the campaign, as well as numerous cartoons.

The suggestion that won the first prize was a plan to use Philfuel for the block test of motors in place of gasoline or city gas. This suggestion contained full details as to the cost of installing the equipment necessary for

Educational Dept. Leads Field With 595 Points
SPECIAL BATTLE SERIES
REFLECTOR
PUBLISHED FOR OAKLAND PONTIAC EMPLOYEES
WAR ON WASTE
MACHINE GUNS SMASH FOE
AS VOLUNTEERS START LAST WEEK OF WAR
REFLECTOR
Head Winning Board Districts
KEEP SENDING IN WASTE SUGGESTIONS, FITCH URGES
WAR ATTRACTS MUCH INTEREST
FOUR BOARDS GIVEN HONORS
Poor Way to Be 'Taken fo
WON'T YOU GET IN—SIR?
SPECIAL BATTLE SERIES
REFLECTOR
PUBLISHED FOR OAKLAND PONTIAC EMPLOYEES
WAR ON WASTE
WAR WINNERS NAMED
Campaign Nets Half Million
C. J. Flynn of Standards Dept. Wins High Award
SAVING EACH YEAR TO RUN TO HUGE SUM
Takes $100 Grand Prize
ANTI-WASTE IDEAS NEED BE ONLY SIMPLE AND PRACTICAL
What Ho! Lads, Listen To This
THANKS FOR YOUR HELP

A SPECIAL Four-Page Newspaper Was Published Daily for the Two Weeks of the Waste Eliminating Campaign

Waste Eliminating Suggestions Offered at Outset of Campaign

ELECTRIC lights and gas fires burning needlessly (gas fires could in many cases be equipped with pilot lights).

* * *

Motors and tools running idly.

* * *

Leaky air hose, water and steam pipes.

* * *

Acetylene torches burning needlessly (could in some cases be equipped with automatic shut-off).

* * *

Scrapping of good material (work with inspection).

* * *

Excessive amounts of tools in workmen's drawers.

* * *

Use of high-priced expense materials for low-priced.

* * *

Wrong use of mallets, files, high-speed steel, carbon steel, etc.

* * *

Excessive consumption of waste and other expense materials.

* * *

Accumulation of unnecessary or excessive amounts of materials, which should be credited back to stores.

* * *

Defective workmanship.

* * *

Removal of unused equipment of all kinds.

* * *

Repair of cracks and crevices in benches, floors, etc., which form receptacles for holding small items such as screws, nuts, washers, etc.

the use of this gaseous fuel. The estimate showed a saving of 6½ cents per motor tested or $2,597 per month based on a production of 1600 motors per day. The cost of the equipment required was placed at $32,943, which would be amortized in about 12½ months.

In the display board contest there were 115 entries. The winning board on one side bore the slogan, "Not a part of the car, but a part of the cost," below which were displayed various small parts that had been scrapped because of defects. On the other side was the slogan, "Use it right—stop the waste." Below this were listed various supplies, such as tools, emery cloth, lamps, belting, grease, fittings, babbitt, etc.

Some of the saving that has been accomplished by the General Motors Corporation by standardization and simplification was referred to in one of the articles in the war campaign publication. This stated that in 1925 the executives of the corporation, realizing that 70 per cent of an automobile is composed of minor parts, instituted a study of the additional savings that might be accomplished through further reduction in the variety of these parts. At that time the average automobile built by General Motors contained 13,000 different parts. One type of bolt was used for one purpose and a slightly different type for another. Different threads were used on different screws. As a result of this investigation the General Motors Corporation in one year reduced the average number of parts in a car from 13,000 to 2110.

Bearing Bronzes Best Suited to Lack of Lubricant

RESEARCH paper No. 68 of the United States Bureau of Standards deals with bearing bronzes made with and without zinc. It was written by H. J. French and E. M. Staples of the bureau. It includes a study of the wearing properties, hardness, structure, toughness and resistance to deformation at temperatures up to 600 deg. Fahr. Based on this study, the bronzes in the copper corner of the copper-tin-lead system have been classified according to the character of service for which they seem best adapted.

Bronzes with less than 4 per cent tin were considered unsuitable for general bearing service. They have low resistance to deformation and wear rapidly in the absence of lubrication. Bronzes with less than about 5 per cent lead seem to be suited only for such service as has the lubrication maintained. Bronzes containing more than 5 per cent lead were found best able, of any of the groups, to operate for short periods without lubricant. With increasing lead percentages, up to 15, the bronzes showed bettering characteristics in this respect, but no appreciable advantages appear in raising lead above 15 per cent.

Addition of 4 per cent of zinc to the copper-tin-lead alloys had, in general, a good influence upon the properties of the bronze. The changes observed included a tendency toward higher hardness and resistance to deformation under repeated blows, to lower friction and lower wear in the absence of oil. However, the effects of zinc additions up to 4 per cent are small and may be insignificant in comparison with changes in properties readily produced from variations in foundry practice.

"Don'ts" for Chain Users

A folder on welded chain recently issued by American Chain Co., Inc., Bridgeport, Conn., contains the following advice on things to avoid:

Don't load a chain above its rated capacity.
Don't subject a chain to jerky loads.
Don't use a chain that appears defective.
Don't fasten chain over sharp corners.
Don't save money by making "home made" slings.
Don't use slings at acute angles if avoidable.
Don't think annealing is a "cure all" for chain ills.
Don't buy chain of doubtful quality.
Don't tie knots in chains or allow them to become twisted.

High-Speed Strip

ROLLS on Continuous Principle Up to 2400 Ft. a Minute and In Coils Up to 2000 Lb. in Weight

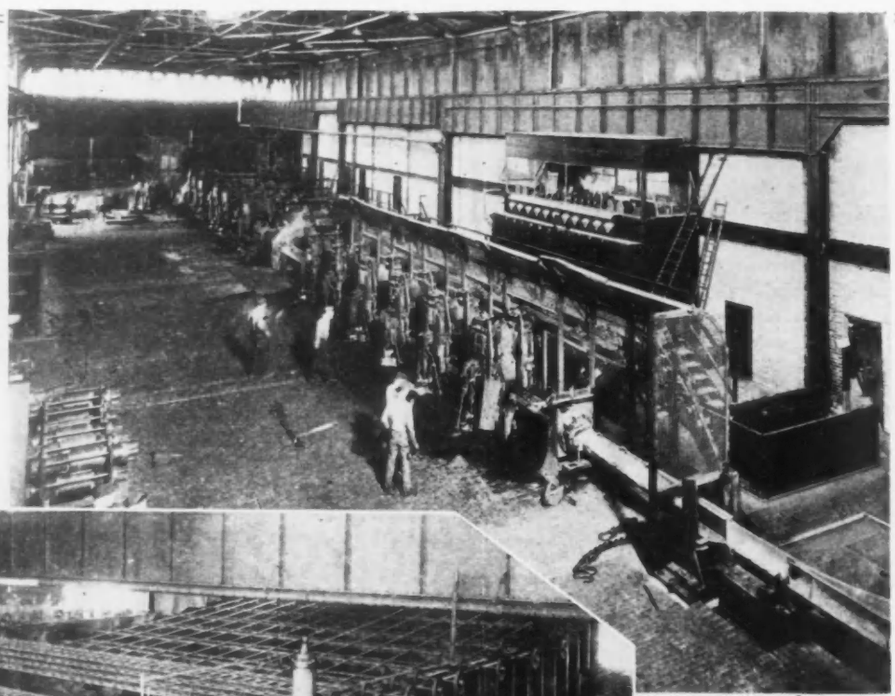
ROLLING of long lengths of hot strip at high delivery speeds and in a range of sizes and gages not ordinarily produced on a single mill has been achieved in a unit recently placed in operation at the Sharon, Pa., plant of the Sharon Steel Hoop Co. It rolls strip 2½ x 0.028 in.; 6 x 0.035 in., 8 x 0.049 in., and 10 x 0.065 in. at speeds up to 2400 ft. per min. and in coils from 150 lb. to 2000 lb. All strip sizes are produced from 30-ft. billets.

The mill and handling equipment are located in two parallel buildings about 500 ft. in length, which extend from the billet storage transcept to the hot warehouse loading transcept buildings. The billets are delivered to the furnace from a mechanical billet platform by a motor-driven roller table through a pinch roller located in the corner of the furnace.

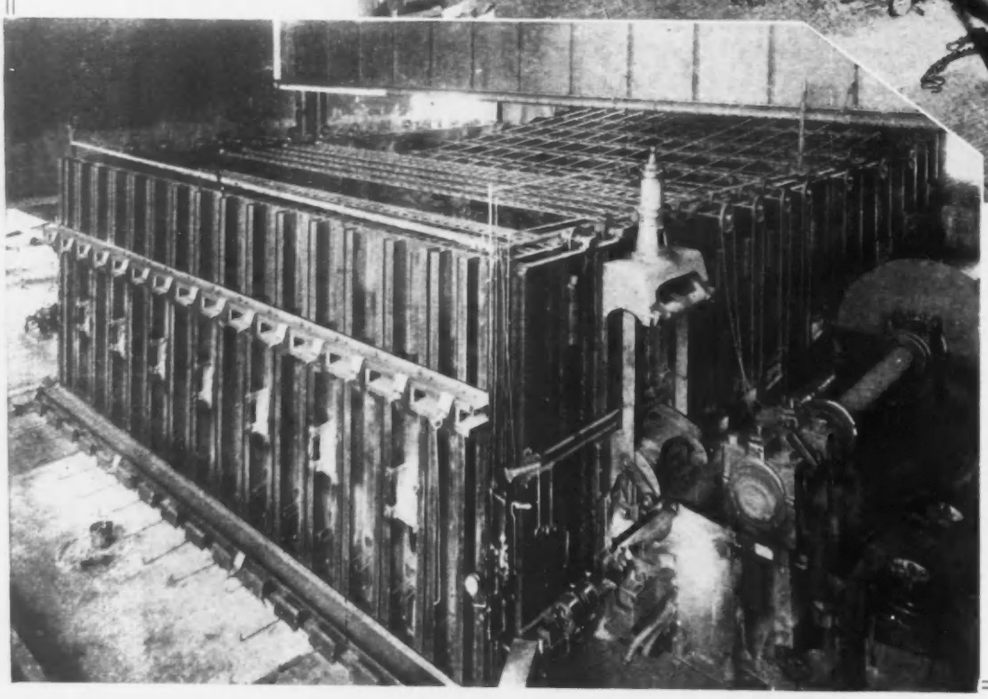
The furnace is 32 ft. wide by 47 ft. long on the hearth, and is completely inclosed on the sides and ends with rolled steel plates. Between the brick walls and the steel plates insulating material has been placed to conserve the heat. The furnace is equipped with a Morgan special metal pipe recuperator stove. A double pusher, electrically driven, is installed for pushing billets through the furnace, and a Morgan-Hawthorne pushout for discharging the billets. A flat roof furnished by the American Arch Co. is used on this furnace. The furnace is fired with producer gas from a Morgan new type producer located near the furnace. The producer, it has been proved, may be depended on to gasify 6000 lb. of coal per hr. The furnace has a capacity of 60 tons of 2-in. thick billets or slabs per hr.

A Morgan up-and-down cut shear is placed between the furnace and the roughing mill. This shear is fed by a set of motor-driven pinch rolls when it is necessary to cut the billets into short lengths; otherwise, the billets are pushed from the furnace directly into the roughing mill.

The roughing mill consists of five trains of 18-in.



THERE Are Six Trains of 14-in. Rolls in the Finishing Mill. The strip is delivered on edge. In the background are the roughing mill and the furnace



PINCH Rolls and An Up-and-Down Shear May Be Seen (view at left) At the Discharge End of the Furnace Which is Enclosed on Sides and Ends with Rolled Steel Plates

Mill at Sharon, Pa.

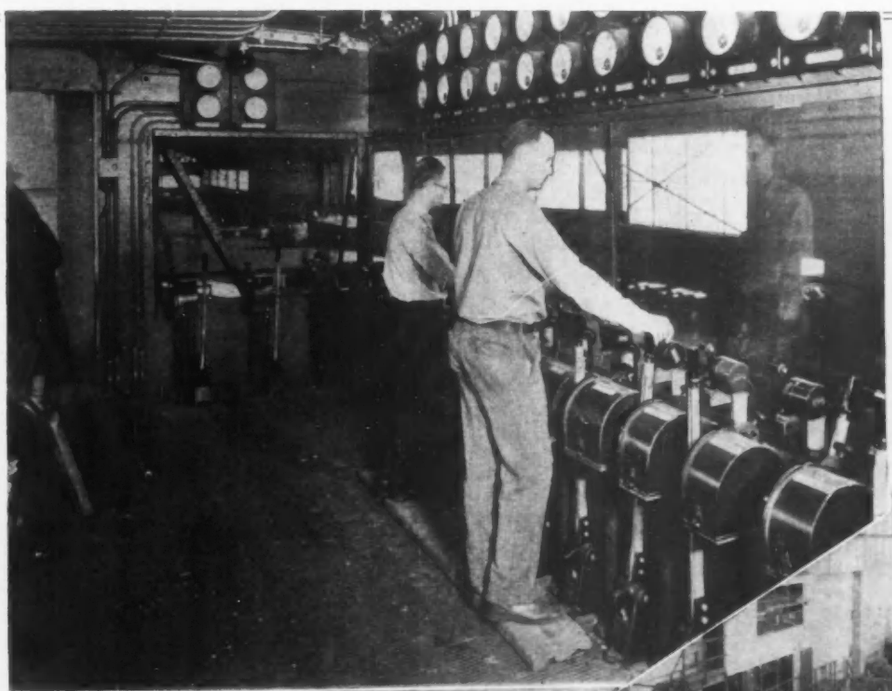
REGULATION of Driving Motors and Means to Prevent Scratching the Product Among the Features

rolls, which are driven by a variable-speed direct-current motor through reducing and helical bevel gears. The bevel gears are inclosed in oil-tight welded steel bases and covers. In the roughing group, four Morgan edging mills with 16-in. and 12-in. rolls are installed. All edging mills are driven by separate motors. Hydraulic water sprays of 1000 lb. pressure are employed in the roughing mill for the removal of all furnace scale and to insure a good surface. After the roughing mill a Morgan steam flying shear is installed for cropping the front ends of the strip.

The finishing mill consists of six trains of 14-in. rolls. Each of these is driven by an individual variable-speed direct-current motor. Double armature motors are used on the first three trains. The six motors are mounted on one large bed plate. Novel features are employed in handling the strip, and in the guides and looping devices, to prevent scratching the product during the rolling operations and afterward when being delivered to the loading and pickling departments.

The strip is delivered from the last finishing mill through a twisted trough to either of two vibrators, which in turn deliver the strip on edge in serpentine form upon slowly moving conveyors. The front end of the piece is then placed in motor-driven pinch rolls that feed it into a shear for cropping, and then into the reel for coiling. The cropping shear may also be used for dividing the strip so that light weight coils may be made without reshearing. When the coil is completed, a motor-driven pulloff places the coil on a conveyor which carries the coils into the loading building where they are assembled on trucks. There are two complete sets of vibrators, conveyors, shears, coilers and delivery conveyors.

The power for this mill is received at 2300 volts, 60 cycles, 3-phase, and is converted to direct current of 600 volts in two 4500-kw. motor-generator sets with a 250-kw. 250-volt direct-connected exciter on each set. One exciter is used for excitation and control purposes, and the



ON the Control Platform Are the Motor Controllers, Meters and Speed Indicators. The roller on mill floor gives orders through a microphone and loud speaker

MOTOR-GENERATOR Set Is in Foreground, Finishing Mill Motors in Left Center and Roughing Mill Motor and Gear Drive in Background

other exciter is used for the auxiliary motors required for the mill. There is also a 250-volt plant service line available for emergency. The roughing mill motor, being of wider spread range than customary, a Ward-Leonard control is employed, using one of the direct-current generators for this service. This arrangement is separately controlled so that it does not interfere with the operation of the other motors. The finishing and edging mill motors are equipped with magnetic control, dynamic braking and emergency reversing.

Operator Gets Instructions through Loud Speaker

In the operating pulpit the following devices are mounted so that the operator has complete control of the motors at this point:—Master switch for starting, stopping and reversing each drive; spring return master switch for the motor-operated coarse adjustment field rheostat for each drive; lever-operated field rheostat for fine speed adjustment for each drive; speed indicators for each drive, and ammeters for each drive. The operators in the pulpit receive instructions regarding operations and speed changes from a loud speaker mounted in the pulpit, the roller talking into a microphone located on the operating floor.

All the mill motors are equipped with speed regulating equipment that holds the speeds of the different motors constant regardless of the load being carried by the different motors. The speed regulators for the edging mill motors are regulated in conjunction with the roughing mill motor, so that as the speed of the roughing mill is changed the speed of the edging mill motor is automatically changed. This avoids separate adjustment of the edging mill motors every time there is a change of speed required for the roughing mill. The speed of each edging mill can, however, be adjusted separately when required. The vibrator motors are also equipped with speed regulators.

The mill was designed and built by the Morgan Construction Co., Worcester, Mass. The electrical equipment was furnished by the General Electric Co., Schenectady, N. Y. The Sharon company's construction force took care of the erection of buildings, the installation of foundations for the machinery, and the mounting of the machinery in place.

German Views on Use of Open-Hearth Decarburizers

TWO articles have recently appeared in issues of *Stahl und Eisen* discussing the use of different decarburizing agents in the open-hearth process, one by S. Schleicher, in the issue of April 4, 1929, pages 458 to 462, and the other by E. Killing, in the issue of April 18, 1929, pages 527 to 531.

In the first article on the general subject of "Comparative Economy of Various Decarburizers," Mr. Schleicher says:

> Trials were made in an open-hearth furnace with various decarburizers with the object of discovering the effect of these on the cost of the process. Rolling mill scale proves to be the most economical, the value of the iron gained being slightly in excess of the cost of the scale and lime added. With pure Swedish ore, after balancing gains and losses, the cost works out at 2.46 shillings per 100 kg. of carbon requiring to be burned. Using siliceous hematite (with Fe_2O_3 57.71, and SiO_2 40.8 per cent.), the cost becomes 10.84 shillings per 100 kg. of carbon burned, the reason for the much higher cost being the increased quantity of lime added and the higher loss of iron by burning.
>
> The quantity of oxygen in the decarburizer does not in the least affect the speed of decarburization, but it does determine the amount of decarburizer required. The decarburizer should be added in a quantity corresponding to the rate of combustion of the carbon in the bath. If added in excess of that rate, the excess iron of the ore used is slagged, instead of going into the bath.

In the second article under the general heading "Conditions on Which the Effects of Decarburizing Agents Depend," E. Killing says in substance:

> The chief factors to consider in choosing a decarburizer are the iron content, the quantity and form of combination of the oxygen, the degree of acidity or basicity, the amount of injurious constituents, the mechanical condition and the moisture, free or combined. The effect of the decarburizer is mainly influenced by the time at which it is added, the bath temperature, the composition of the charge and of the slag, the composition of the gas and quantity of air for combustion, and the hearth area.
>
> The kind of ore chosen may have quite an appreciable effect on the cost of production. The theoretical calculations concerning the advantage of ferric oxide as compared with ferrous have proved true in practice. A high silica content in a decarburizer greatly reduces its efficiency.

Temperature Measurement by Means of Color Transition

WHAT appears to be a new principle in optical pyrometry is incorporated in an instrument recently described by Dr. G. Naeser.*

As is well known, the radiation from a "black body" is composed of the various primary colors, the relative amounts of each depending on the temperature of the radiator. This is the basis for the conventional scheme of "color temperatures."

The new pyrometer contains first a filter which transmits only two wavelengths—such as red and green. The light is then passed through a wedge-shaped filter in which one wavelength—the green—is absorbed more completely with increasing thickness than the other. As a result part of the wedge appears green and part red. At the division between the two colors a line of white appears, due to the equal absorption of red and green. A change in temperature produces a change in the relative amounts of red and green in the radiation, with consequent lateral shift of the white line along the wedge.

It is claimed that an accuracy of plus or minus 13 deg. C. is obtained between 900 and 2000 deg. This could doubtless be increased considerably. One possible difficulty is that of partial color-blindness of the operator—if the eye is more sensitive to red than to green, the white will apparently be displaced toward the green end of the wedge. This may be taken care of, says Dr. Naeser, by sighting first with one eye and then with the other.

*Stahl und Eisen, April 4, 1929.

Edgar Allen Steel Co., Inc., 741 Washington Street, New York, exclusive representative in the United States of Edgar Allen & Co., Ltd., Sheffield, England, has opened an office at 704 Fisher Building, Detroit, and will carry complete stocks of Allen tool steels in that city.

Conveyors Reduce Assembly Costs

Studebaker Corporation Cuts Labor Expense 15 Per Cent and Doubles Output by Using Conveyors for Sub-Assembly and Final Assembly Operations

IN doubling its capacity for producing automobiles, the Studebaker Corporation has rearranged its plant at South Bend, Ind., so that the major part of the sub-assembly and final assembly work is done on conveyors. While mechanical handling of materials has become the rule rather than the exception in the automobile industry, chief interest lies in the new uses and the increasing flexibility of the systems which are installed to meet the special needs of each manufacturer.

At the Studebaker plant there are innovations in handling parts which should attract more than passing attention. Motors, for example, are carried on an overhead conveyor 2810 ft. from the motor building to the final assembly lines, where they are lowered into the chassis. This conveyor is capable of handling 177,000 lb. of work at one time and of delivering 100 motors an hour to four final assembly lines, motors being distributed along the conveyor at 10-ft. intervals.

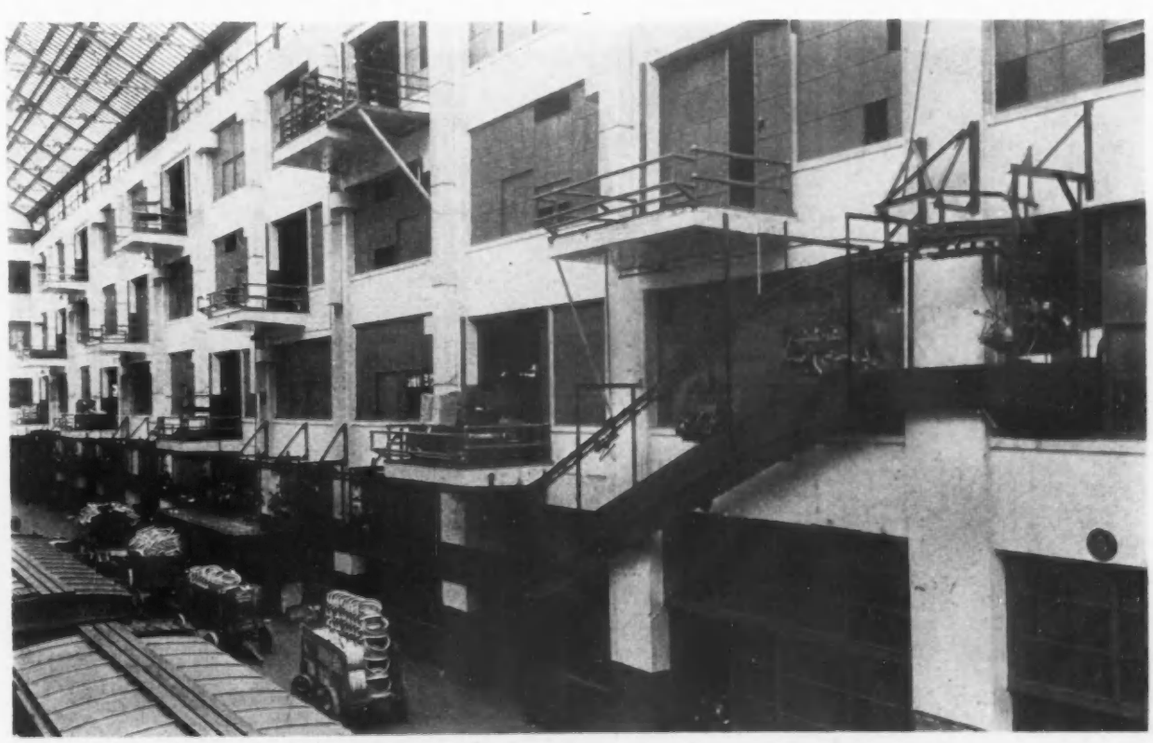
Another unusual installation is an overhead chain conveyor for transporting all chassis sheet metal parts from the enameling and lacquer departments through three floors of three buildings to the final assembly lines. This conveyor is 2200 ft. long.

There are many other features indicating increased skill and efficiency with which mechanical conveyors are being used. Where space is needed for manufacturing operations, overhead conveyors are raised to a point which does not interfere with the operation of machine tools or other equipment. At other points, where material carried by the conveyor must be within reach of workmen or where conveyors cross one another, the monorail carrier dips conveniently.

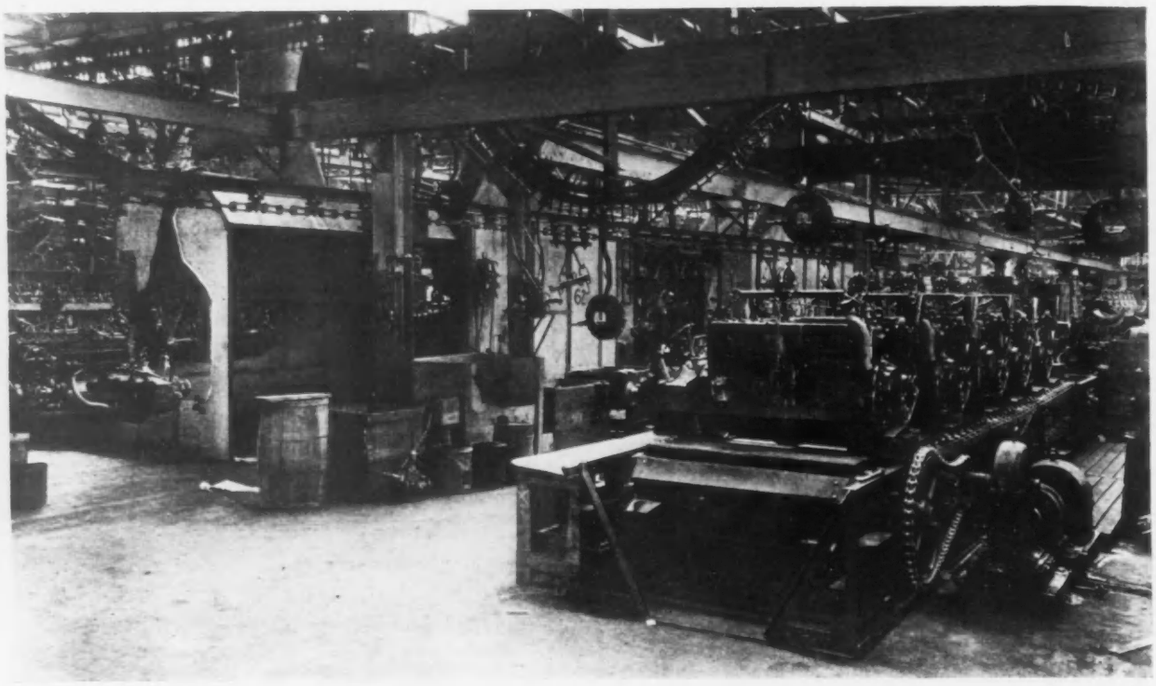
Versatility Shown in Design of Hooks

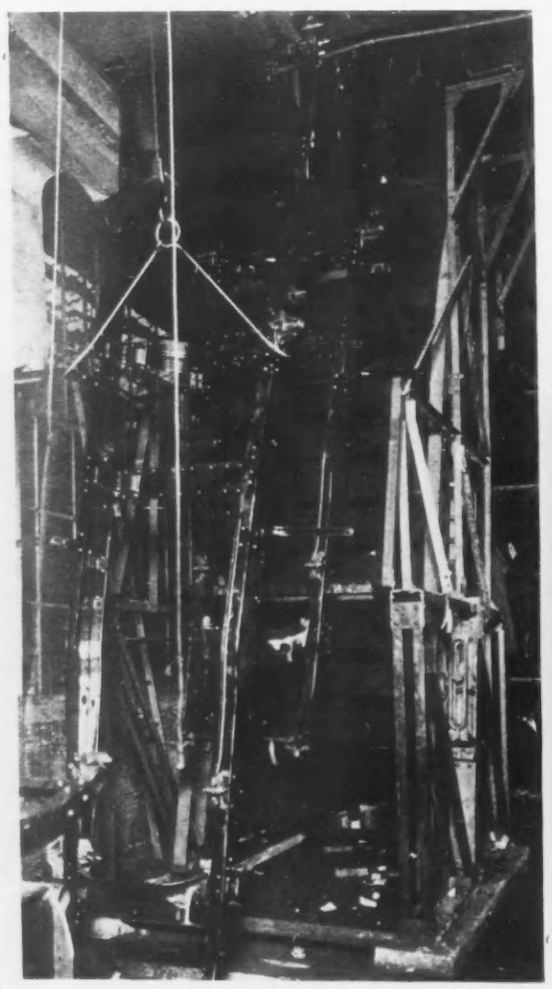
Aside from the flexibility of the conveyors, great versatility has been shown in the design of special hooks and carriers on which parts are placed for movement along the conveyor line. These hooks have been made so that parts can be attached to them with a minimum of time and effort and can be transported without damage.

The conveying system is by no means confined to overhead conveyors, for the roller type also has been installed in connection with certain operations. Cylinder blocks, for example, are machined on tools adjoining four parallel roller conveyors 800 ft. long. Differing from the practice in some other automobile plants, Studebaker

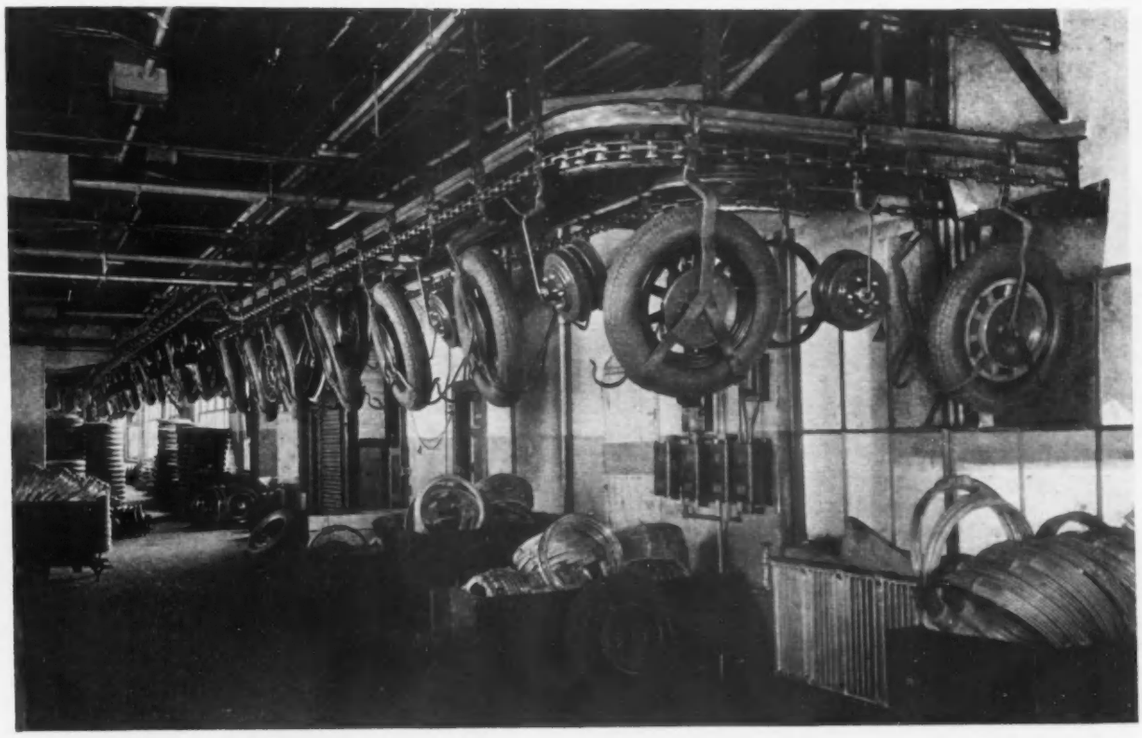


TO Avoid Interfering with Manufacturing Operations, Motors Being Carried by Overhead Chain Conveyor to Main Car Assembly Lines Move From One Floor to Another Along Wall Just Outside Building. Protection against accidental fall is afforded by metal screen running beneath conveyor

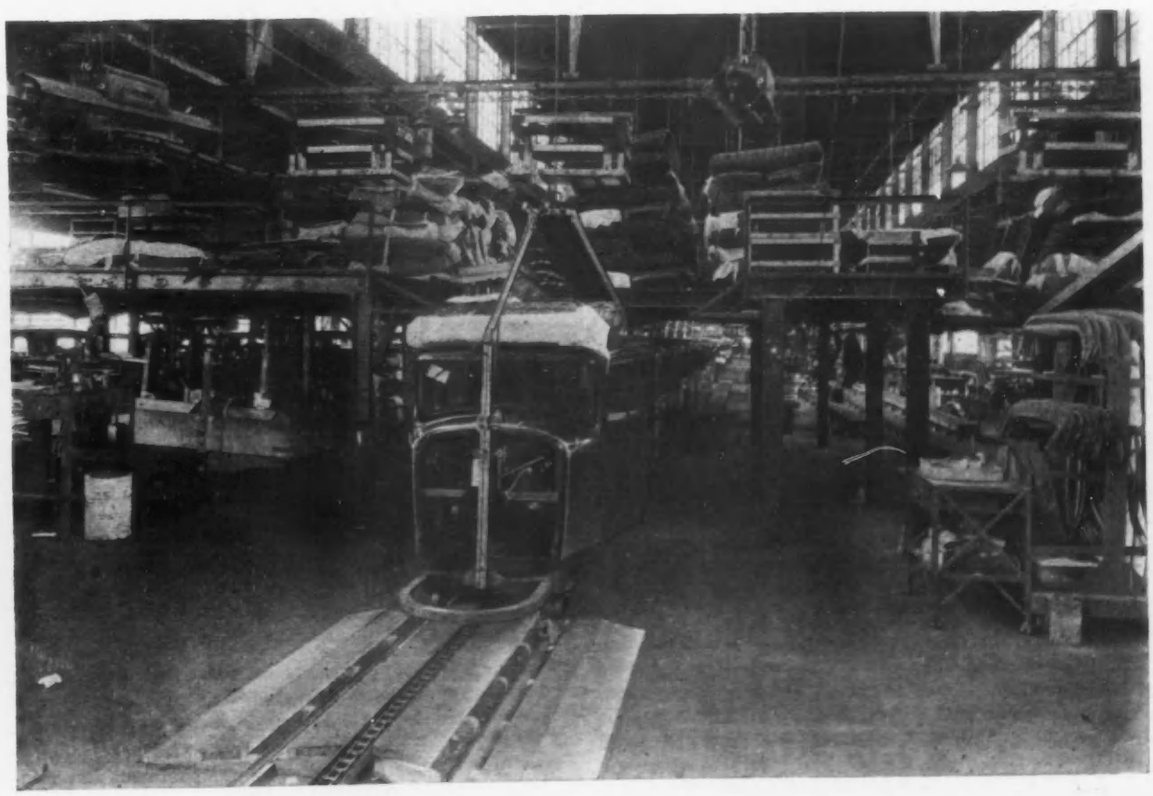




MOTORS Are Set Crosswise on Short Slat Conveyor with Flywheel End Overhanging So That Transmission Can Be Assembled (Above). Frames are carried at 15-deg. angle from first to second floor of assembly building on double-chain slat type conveyor (left). Springs and axles are added (below) while frame is in upside down position on slat conveyor with structural uprights 30-in. high



WHEELS Are Carried on Special Racks on Overhead Chain Conveyor to Assembly Line (above). Garnish moldings and instrument boards (below) are delivered to body assembly line by overhead conveyor



engineers have not routed conveyors under machine tools in order to have machining done without removing the cylinder blocks from the conveyors; instead a rope hoist is employed to lift cylinder blocks from conveyors on to machine tools, and in this way delays are avoided when tools are being repaired.

Running at right angles to the cylinder machining lines and connected to them are four roller conveyors on which motors are assembled. It is here that connecting rods, valves, camshafts, pistons and crankshafts are added to the cylinder block. During their progress along the line, motors are upside down for part of the journey, but are righted in a "barrel turnover." For boring the face of the flywheel housing, motors are taken off the conveyor by crane and are set in a specially-designed boring stand.

At the end of the assembly line, motors are placed by crane on a chain conveyor equipped with steel plate carriers, which carry motors at a 30-deg. angle. The framework of this conveyor is narrow so that operators can get at the motors easily. The use of the conveyor has eliminated the necessity of constructing rotating stands for the motors and has proved economical. It is here that the flywheel, clutch, cylinder head, timing gear, timing gear cover, starter, generator, water pump, ignition system, manifolding and carburetor are assembled.

Motors Transferred to Run-In Stands

Motors are transferred from the chain conveyor to run-in stands by crane, where they are cleaned and driven with kerosene, and from there to dynamometer stands for a dynamometer test. From the dynamometer stands motors are picked up by crane and set crosswise on a short slat conveyor with the flywheel end overhanging so that the transmission can be assembled. Transmissions come to the assembly line on an overhead chain conveyor, which crosses all four main motor assembly lines. The slat conveyor runs to the edge of the crane bay, where motors are removed by crane and hung on the motor delivery conveyor, which carries them to the main assembly lines. The transfer work is done while the motor delivery conveyor is in motion.

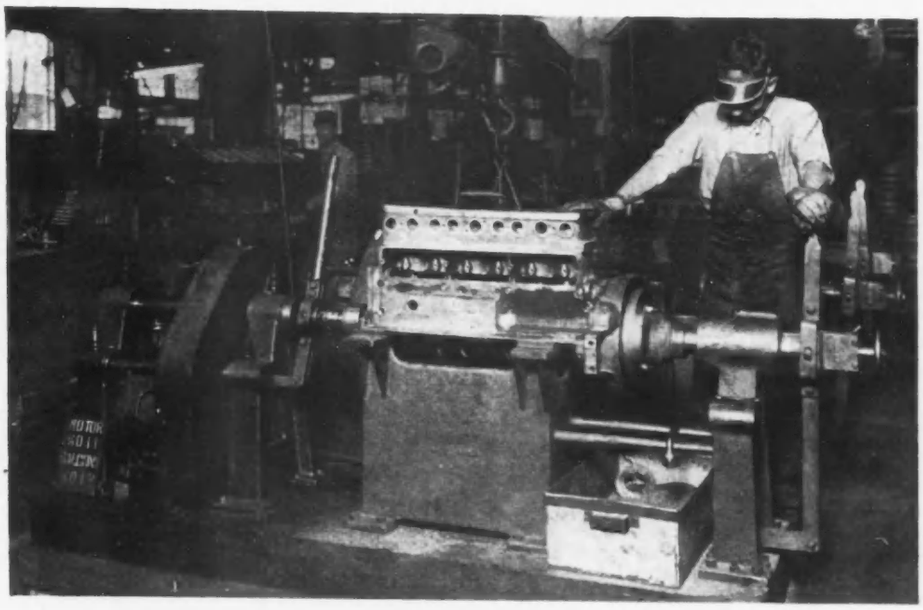
Motors on the delivery conveyor go through a paint spray booth, where they receive a coat of paint, and then begin the journey to the main car assembly lines. During this trip they are routed so as to avoid interfering with manufacturing operations. At some points they move from one floor to another on the overhead conveyor along the wall just outside the building. In such cases protection against accidental fall is afforded by means of a metal screen running beneath the conveyor. This conveyor carries eight-cylinder motors weighing 1200 lb. including transmission, at a speed ranging from 4.16 ft. to 16.6 ft. a min. It is operated by a 5-hp. motor and has a dual mechanical drive.

TO Save Floor Space in Assembly Building, Bodies Are "Nosed" by a Specially Designed Mechanical Device and Are Stored in That Position to Await Movement to Main Assembly Lines

In the piston department, pistons are handled on a roller conveyor which in every respect, except size, resembles a standard roller conveyor. It is just wide enough to accommodate a piston, and its rollers are made of ¾-in. standard pipe. It was designed and built by the company. Crankshafts are delivered from the machining department to the motor assembly lines on an overhead chain conveyor on which they are hung endwise.

All Conveyors Lead to Main Assembly Lines

The main car assembly lines are the central point to which all parts are delivered, and consequently all conveyors used for carrying these parts have the assembly lines as their destination. Front axles are machined on the fourth floor of the machine department building, the work flowing from the west to the east end, while rear axles are machined on the third floor. At the east end



FOR Boring Face of Flywheel Housing, Motors Are Taken Off Conveyor by Crane and Are Set in Special Boring Stand

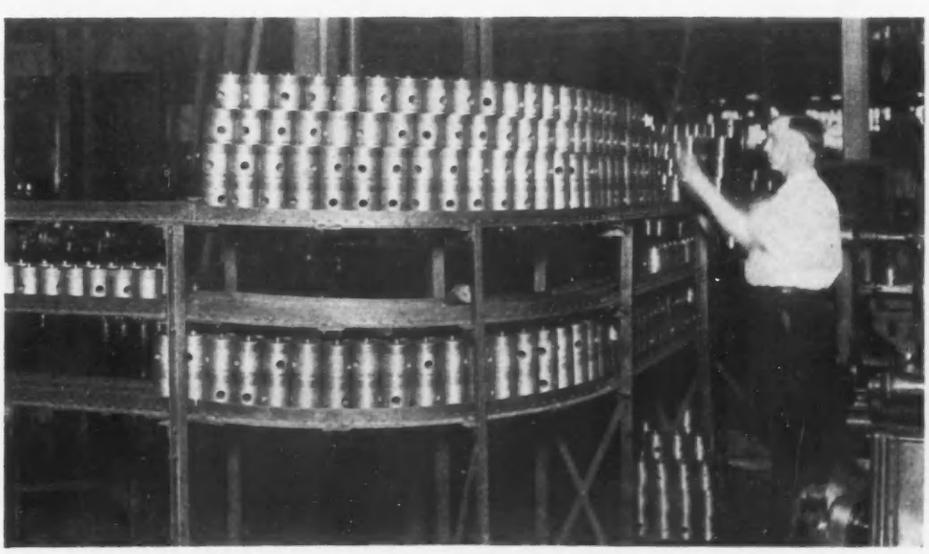
of the fourth floor, front axles are hung on an overhead conveyor which passes down to the third floor, where rear axles are added. The conveyor then goes through a spray booth and axles receive a prime coat of paint. From the spray booth the conveyor travels down a bridge to the second floor, where it serves the axle storage department, and thence moves to the four final assembly lines.

Tire rims, tires and wheels are handled by overhead chain conveyor from storage through assembly, and finished wheels are carried to the final car assembly lines on another overhead conveyor 840 ft. long moving at a rate of 24 ft. a min. At the end of the lacquer department, finished hoods are hung endwise from the inside of the louver on an overhead chain conveyor and thence are delivered to the proper point along the final car assembly lines.

The conveyor for chassis sheet metal parts, already referred to, transports front and rear fenders, side splash guards, radiator dust pans, gas tank covers and trunk racks from the enameling department or the lacquer department through the storage department on the third floor to the final car assembly lines on the second floor. In the course of its journey it travels in three floors of three buildings. Passage through the storage department makes possible the removal there of rejected parts and the substitution in the blank spaces of new parts taken from storage. If the conveyor is delivering material to the assembly lines too rapidly, parts are taken off in the storage department to await demand.

Frames Assembled on Slat Type Conveyor

On the first floor of the final car assembly building, automobile frames, which are purchased from an outside source, move by hand along a metal table where running board brackets are fastened to the frames. At the end of the table the frames are lifted by an electric hoist on to a conveyor, which carries them at an angle of



PISTONS Are Handled on Roller Conveyor Just Wide Enough to Accommodate a Piston. Rollers are made of ¾-in. standard pipe

15 deg. to the second floor. Here springs and axles are added while the frames are upside down and the conveyor passes through a spray booth where the frames are given a coat of paint. At the end of the conveyor, frames are turned over into an upright position by means of a mechanically-operated hook. The frame conveyor is of the double-chain slat type with structural uprights 30 in. high to carry the frames.

There are four parallel final assembly lines, which are served by conveyors somewhat similar in construction to the frame conveyor. These conveyors have chassis stations between which are steel flights where operators can work. They are designed to accommodate any length chassis having a wheel base ranging from 109 in. to 135 in. It is along these two final assembly lines that the body, wheels, sheet metal parts, bumpers, and other small parts are added. Cars move down the first two lines and back along the third and fourth, actually being carried backward in the latter case. During the last 50 ft. along the third and fourth lines, the motor of the car is started and it is backed under its own power off the conveyor and on to an automatic elevator, which lowers it to the first floor. At the point where cars move under their own power, an overhead exhaust system has been provided to remove fumes.

Cars Move Down "Doll-Up Line"

On the first floor the cars are towed on a "doll-up" conveyor by drag chain, where they are rigidly inspected and polished and where any minor blemishes are removed.

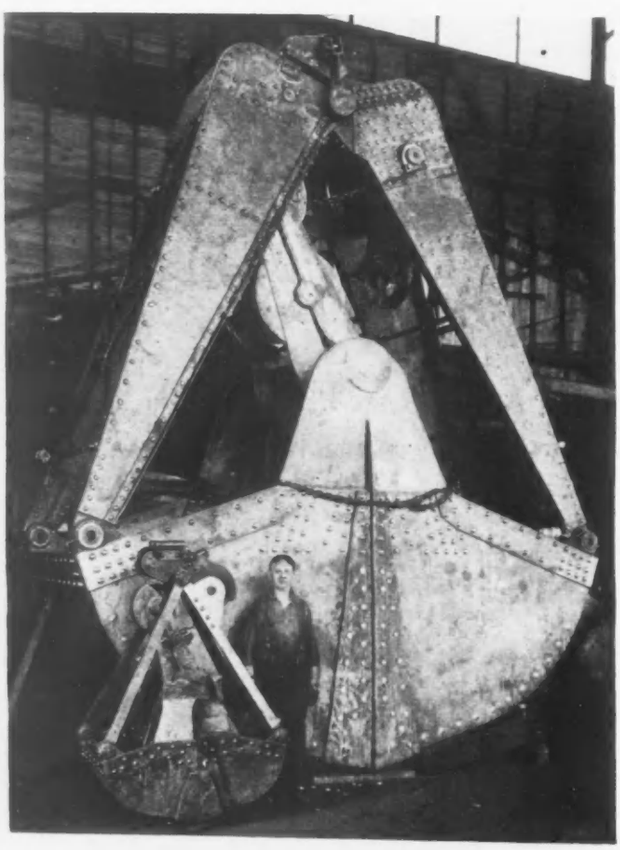
Installation of conveyors has resulted in expanding the use of old buildings and in concentrating manufacturing operations in a floor space in which heretofore it was impossible to produce more than 400 instead of the present 900 cars a day. Moreover, labor costs have been cut down about 15 per cent.

The conveyors on which motors are assembled and then are transported to the final assembly lines were designed and installed by the Jervis B. Webb Co., Detroit. The frame conveyor and the conveyors for the final assembly lines are the products of Mechanical Handling Systems, Inc., Detroit, while the conveyor delivering sheet metal parts from the enameling and lacquer departments to the final assembly lines was built by the Anchor Steel & Engineering Co., Detroit.

Action of Inhibitors in Pickling Solutions

CERTAIN inhibitors reduce the rate of solution of metals in acid solutions. F. N. Speller, metallurgical engineer, National Tube Co., in an address Dec. 28, 1928, before the American Association for the Advancement of Science said that this is due to an increase in the hydrogen overpotential, which is generally assumed to be due to formation of a film of discharged inhibitor substances adsorbed on the cathodic areas. The theory of inhibitor action has been well stated as follows:

When immersed in acid, iron goes into solution at the anode areas, forming ions and discharging hydrogen ions at the cathode areas. These cathode areas may be said to occur principally in the narrow spaces of the grain boundaries in steel, or between the metal and slag in wrought iron. Most inhibitors are either bases, such as quinoline, or positively charged colloids, and when these are present they travel to the cathode areas with the hydrogen. When the positively charged heavy particles are discharged, they cannot escape by gaseous evolution and accordingly are adsorbed on the surface, building up a protective layer.



Clamshell Bucket Takes 10 Tons of Coal at a Time

A CLAMSHELL bucket of 16½-yd. capacity has been shipped by the G. H. Williams Co., Erie, Pa., to the Donner Steel Co., Buffalo. At one grab it picks up 10 gross tons of coal. Alongside it, in the picture, is shown a Williams ⅜-yd. clamshell.

From the bottom of the scoop to the top of the head, the big coal bucket measures 18 ft. 9 in. in height. When it is lowered, open, upon a pile of coal, its scoops have a spread of 19 ft. The area covered by the spreading scoops is 133 sq. ft.

It was designed especially to increase the capacity of a crane already in use on the docks of the Donner Steel Co. The designers are proud of the fact that it weighs only 28,000 lb.

The bucket is of the four-rope type, which gives the operator positive control, even on a high bridge crane, where the bucket must be lowered a considerable distance. The twin-power-arm design serves to prevent cable twisting, and also eliminates "side leads" of closing cable. The closing line sheaves on each of the twin-power arms work always in the one plane, giving a straight-line pull. This is calculated to save wear on sheaves, flanges and bearings, as well as cable.

Assessing Obsolescence of Patterns

Methods of Determining When They Are No Longer Likely to Be Required —Periodic Survey Suggested

PERHAPS the most common procedure has been to cull out obsolete patterns whenever the storage space has become cramped. This method does not provide an efficient solution to the problem. A review of the more effective methods reported by some of the companies cooperating in this survey may be helpful.

Drives to Eliminate Patterns

Falk Corporation has on occasions made periodic drives to eliminate some of its patterns. It found that invariably after this procedure it ran into difficulties, as its customers shortly afterward ordered castings from the patterns which were discarded.

De Laval Steam Turbine Co., on its last drive to eliminate some of its obsolete patterns, destroyed a large pattern. Six months later this pattern was called for and had to be replaced at a cost of $1,500.

National Cash Register Co. disposes of its obsolete patterns, because the company finds that the cost of remaking the few patterns which may be called for later is less than the storage costs would be if all were retained.

One of the plants of Ingersoll-Rand Co. has found it better business occasionally to replace a pattern which has been destroyed than to invest thousands of dollars in storage facilities for patterns that are not moving. The greatest care is exercised before any pattern is destroyed, and it has been found necessary to replace only a few.

Definite Time Interval

Some companies have adopted a definite time interval of inactivity of the pattern before it is to be destroyed. This procedure is rather precarious, although it has proved a satisfactory solution to the problem in individual instances.

E. W. Bliss Co. destroys all patterns which have not been used in five years. The company also gives consideration to the advisability of destroying some which there is reason to believe will not be used again, even though they may not be five years old.

R. D. Nuttall Co. disposes of all patterns not used by it for ten years. Before destroying a pattern, however, the company makes a careful study to ascertain if there is not a possibility of revising it to meet later requirements.

I. P. Morris Corporation recently established the ruling that patterns not used for five years are to be destroyed. On some of the largest of its turbines, on which the pattern cost is relatively small as compared with the ultimate cost of the product, and for which there is not likely to be any demand for duplication or replacement for at least two years, the patterns are destroyed as soon as all castings made therefrom are machined and tested. The firm has found, after a period of six months in which this ruling has been in effect, that there has resulted a reduction in pattern storage area of 75 to 80 per cent.

Another method is to have the engineering department or the sales department make the final decision as to the disposition of the patterns. Every ten years the Brown & Sharpe Mfg. Co. reviews all of its patterns which have been inactive during that period, and destroys those decided upon after proper consideration by its engineering department.

Builders Iron Foundry examines its patterns at least once a year, at which time it discards all those which are obsolete. In this process, the salesmen are consulted on those patterns in which they may be most interested. The effort is on the side of having too few rather than two many patterns, but in practice the firm has found a good many that do not pay by their use for the space occupied.

Sometimes there are in an organization one or two members fully qualified to take action on the patterns; where such is the case, their decision is final. An example of this may be found in the practice of a large mid-western company which goes over its patterns annually; all obsolete patterns are immediately scrapped. The responsibility for the decision is left to the man in charge of patterns and the assistant to the president, who is thoroughly conversant with the sales and service needs.

Retaining All Patterns

There are instances where, because of the nature of a product or the policy of a company, all patterns are retained, even though they would ordinarily be classed as obsolete. Skinner Engine Co. has found it has to supply repair parts for engines which it built 25 to 30 years ago. It feels, therefore, obliged to keep all its patterns, and no obsolete classification is attempted.

Busch-Sulzer Brothers Diesel Engine Co. maintains patterns for its commercial product as long as the engines are in service. This necessitates extensive pattern storage. But since the longer a machine is in service the more likely replacement parts will become necessary, the company does not believe it is advisable for it to destroy patterns even 25 years old.

Riley Stoker Corporation has been engaged in the stoker business for almost 50 years, and has in that time accumulated a great many patterns. As long as a stoker of the firm's manufacture is in service, it feels duty bound to supply renewal parts whenever required.

Waterbury Tool Co. keeps the patterns of its regular product indefinitely, as do both Murray Iron Works Co. and De La Vergne Machine Co., since they believe it is to their advantage to be able to supply repair parts for their respective machines whenever called upon to do so.

Some firms retain certain classes of patterns, but destroy others, the procedure depending, as before suggested, upon the nature of the product. There are many instances where only specific parts of a unit would under ordinary circumstances need replacement within the life of the unit. In these cases, it would obviously be of no particular advantage to retain and store all the patterns for the complete unit.

United States Radiator Corporation, for instance,

This is the concluding installment of the article "Obsolete and Inactive Patterns," the first portion of which appeared in THE IRON AGE of July 25, page 215.

finds it necessary to keep only the patterns of parts of its various products which are subject to wear. Years after a heating boiler is installed in a residence, an owner would resent being put to a heavy expense to replace his entire boiler simply because the manufacturer was unable to furnish a grate bar which had burned out. A grate bar of obsolete pattern, even at what appears to be an exorbitant price per pound, is an economical repair.

Buckwalter Stove Co. has found it good practice to destroy, after a reasonable period of time, all patterns for its stoves with the exception of the fireboxes and the firebox parts. B. F. Sturtevant Company destroys all patterns of any special designs which have not worked out to be salable in any volume. This aids in keeping the pattern storage space free of unproductive patterns.

When a large part of a piece of equipment fails after a number of years of service, the cost of the repair usually approaches closely the cost of a new unit. With a little calculation of obsolescence, a new sale often can be made, and the manufacturer is money ahead to encourage this transaction by making a scrap value allowance for the old unit.

Several Jobbing Foundry Methods

Several methods are pursued by jobbing foundries. One is to keep all customers' patterns until called for. This may work a hardship on the foundry, and often necessitates the foundry's requesting the customer to give permission for the return of certain patterns, which permission may or may not be given. In one such case a foundry, after the first request was unanswered, asked its customer again, this time stating that if the patterns in question were not removed by a specified date, they would be put outside. This method obviously is poor practice. It not only causes the foundry to stand a large share of the burden of storage but also presents possibilities of unpleasantness with customers.

Another method adopted by some foundries is to have an understanding with the customer that all patterns not active will be retained without charge for a definite period of time only. After the expiration of this time, and upon notification by the foundry, storage charges are made to the customer for retaining his pattern. This system is found more equitable for both the foundry and the customer, and precludes the possibility of difficulties which may arise when no time limit is placed upon the storage of customers' patterns.

Reclassification

The practice of the Barber-Colman Co. gives an interesting example of the reclassification system for the handling of obsolete patterns. In its pattern storage the company has reserved certain shelves for obsolete patterns. At intervals of three years these patterns are checked by the engineers interested, who decide which patterns are entirely useless and those that may be needed at some future date for making castings for repairs.

Patterns which are found to be entirely useless are destroyed, and patterns which there may be occasion to use are packed in large boxes and the boxes stored in a space in the warehouse assigned for this purpose. Each box of patterns is given a number and a complete record of its contents is made and kept for reference, so that whenever need for one of these patterns develops, it can readily be located and used, after which it is returned to its box.

George D. Roper Corporation classifies its patterns as (1) Active; (2) Inactive; and (3) Obsolete. The inactive patterns are stored with the active patterns and occupy about twice as much space. They are considered inactive because they are used only for furnishing repairs, and some of them are almost 20 years old. The obsolete patterns are stocked in a separate space and kept for their salvage value. This space occupies about one-fifth the space required for the active patterns.

Fairbanks, Morse & Co. remove their patterns to their service department pattern storage as soon as a product is discontinued. The warehouse is checked two or three times a year, and as many patterns are disposed of as possible.

Card System

A system which has many valuable features is a card index of all patterns. When properly applied, this is reported to be of inestimable value in solving the obsolete pattern problem. Allis-Chalmers Mfg. Co. maintains in its pattern shop a card index of all patterns. On each card it posts the date the pattern is taken out of storage and used in the foundry, as well as the date it is returned to storage. The cards act as a guide to the activity of the patterns, and lists are prepared several times during the year, showing patterns which have not been used during a period of approximately five years. These lists are then forwarded to the various engineering departments for their recommendations as to whether the patterns are to be retained in storage or destroyed.

It does not necessarily follow that any pattern which has not been used during a period of five years is to be destroyed, as the engineers who make the decision may consider the pattern to have sufficient prospective value to justify the expense of continued storage. The period of inactivity, therefore, is not the sole consideration, as the engineers, familiar with all the factors involved, must weigh the going value of the pattern against the cost of storage, as well as the company's obligation to its customers in furnishing repair parts.

Link-Belt Co. also has inaugurated a card system for use in its pattern vaults. The form of card which this company uses is shown in Fig 1. It will be noted that this card carries a full description of the pattern, covers the question as to whether it is wood or metal, and lists all core boxes and loose parts. It also gives data as to the location of the pattern, so that anyone wishing to use the pattern can readily find it by referring to this card. At the bottom of the card is a record which indicates not only the location of the pattern at all times, but also how often the pattern has been used over a given period of time. Thus at the end of any interval, the cards can be reviewed and decisions made as to which patterns to retain, and which ones can be scrapped.

Isbell-Porter Co. maintains a somewhat similar system, using the information contained on the cards in much the same manner as above. The card used by Isbell-Porter Co. is illustrated in Fig. 2.

Periodic Survey

Numerous companies make periodic surveys of their patterns in storage, to determine which are obsolete and can be destroyed. Several methods are in use. One is to review the records of the various patterns to ascertain their activity. This is usually done either by a special representative who is familiar with the patterns, sales and production, or jointly by members of the sales and engineering departments who are fully acquainted with all the factors involved.

National Cash Register Co. makes semi-annual inspections of all its patterns not in actual use, and which have not been used during the previous six months. These are then laid aside, and all patterns for which there has been no call during the year are passed upon by the Inspection Committee. This committee consists of the men in charge of the pattern, foundry, general machine, tool room and tool supply departments. They are familiar with the requirements and are in a position to determine whether the patterns will be used in the future. The pattern is scrapped when the committee so decides.

The procedure followed by Morgan Construction Co. presents an interesting example of the application of this method, used in conjunction with a card system. The company places full responsibility for its pattern policy in its Pattern Committee, which is composed of the general superintendent, chief draftsman, a designer, pattern shop foreman, pattern records and storage man, and the treasurer of the company. The committee meets at least once a month. It takes into consideration three factors in determining the obsolescence of the patterns:

1. Notification by the engineering department of a change in design.
2. Inactivity of a pattern for five years. This is determined by reference to the pattern record cards.

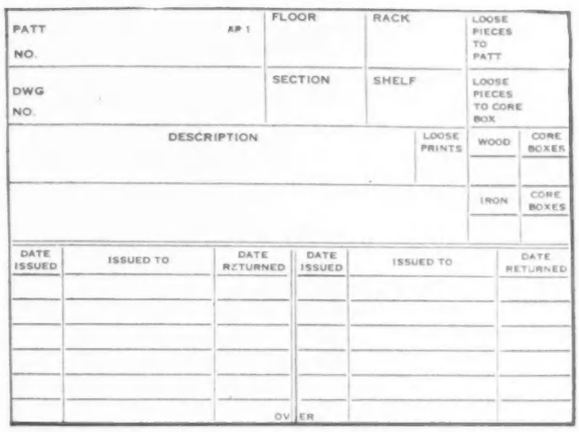
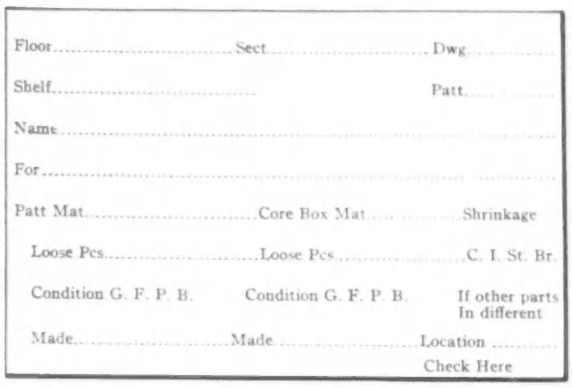


FIG. 1—Link-Belt Co. Card (Above) for Patterns in Storage. The back of the card duplicates the lower half of the front (here shown), thus providing space for recording many instances of use



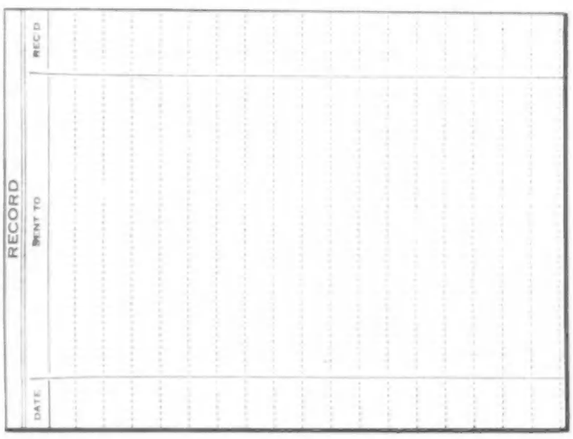


FIG. 2—Isbell-Porter Co. Uses This Card (at right) to Keep Records of Stored Patterns

3. Notification from pattern storage department of irreparably poor condition of a pattern.

Pattern record cards covering about 200 patterns are reviewed by the Pattern Committee. Notations are made on the cards through the use of two rubber stamps, one reading "Scrapped" and the other "Reviewed." The latter stamp indicates the decision of the committee to withhold scrapping the pattern until a later date. In every case where a pattern comes before the committee for consideration, dating stamp bearing the meeting date is imprinted next to the stamp showing the committee's decision.

Following the meeting, the record cards of patterns which have been declared obsolete by the Pattern Committee are turned over to a secretary, who prepares notices to be sent to all customers who have previously had castings made from the patterns in question. These are sent out with a statement that the patterns have been declared obsolete, and giving the customers an opportunity to purchase spares or castings from the patterns within 30 days after the date of notice. This procedure avoids in large measure the possibility of scrapping a pattern one day, and receiving an order on the following day for a casting from the pattern. Records of the Pattern Committee from 1924 to May 18, 1928, indicate a total of 8959 patterns scrapped during that period.

Rare Metal Columbium Now Available

At the recent Exposition of Chemical Industries in New York, the first metallic columbium made in the United States was exhibited by Dr. C. W. Balke, chemical director of Fansteel Products Co., North Chicago, Ill. Columbium, it will be remembered, is a rare metal similar in many ways to tantalum, which also was first produced in America by Dr. Balke.

Like tantalum, columbium is inert to practically all chemical action, and is soluble only in a mixture of nitric and hydrofluoric acids. In electrolytes the metal is unidirectional. It readily absorbs gases by occlusion, and has been patented as a "getter" in vacuum tubes. Columbium is very ductile and is easily worked cold. It may be rolled, drawn, hammered, formed or cut with ordinary metal-working tools. It welds readily to itself and other metals by the spot welding process. However, the metal must not be subjected to any great amount of heat in atmosphere, or it will become brittle.

Except for about a half-ounce made by Siemens in 1906, the Fansteel exhibit represented, it is asserted, all the metallic columbium in the world. The exhibit consisted of several pounds of the metal in sheets, bars, rods and wire.

There are workable deposits of columbite in the black hills of South Dakota, and the ore is also found in several other places on the North American Continent. In value, the metal is about one-seventh the price of platinum, and about half the price of gold.

Building Machines of Welded Steel

Has Advantages for Equipment Infrequently Ordered, and as Step in Developing New Lines—Cast Construction Economical for Machines Produced in Quantity

BY D. M. LUEHRS*

A GREAT deal has been published in the technical press relating to the substitution of welded-steel for cast-iron and cast-steel construction. Much of the work described, such as shears, concrete mixers, cranes and crane runways, has been of comparatively simple design and has involved very little attempt, even by the designer in cast metals, to produce really pleasing looking as well as highly efficient equipment. The majority of machine designers are perhaps unaware that welded steel can be embodied in the construction of machine tools and still produce a machine of pleasing appearance, eliminating square corners and brackets upon which workmen may accumulate waste, oil cans, etc.

*President, Luehrs Co., designer and builder of automatic machinery, Fostoria, Ohio.

Attempts have been made by some promoters of welding to substitute welded-steel construction wherever cast metal is used. That is an impractical proposition. The company with which the writer is connected has been building machine tools and other machinery of welded steel since 1914 and has had numerous opportunities to determine where welded steel leaves off and cast construction begins.

Welded steel construction is ideal for special machines, only one or two of which are to be built. It is also of advantage in building the first standard machine of a new design, or for building standard equipment, especially of large size, for which orders are received only once or twice a year.

In the case of the special machine there is always more or less development work during the entire construction period. Machine designers are not infallible and numerous alterations usually have to be made in the design. It costs practically as much to build a set of

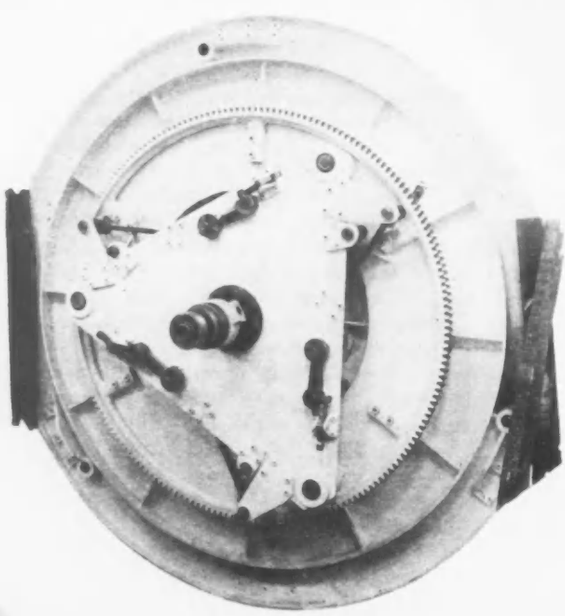
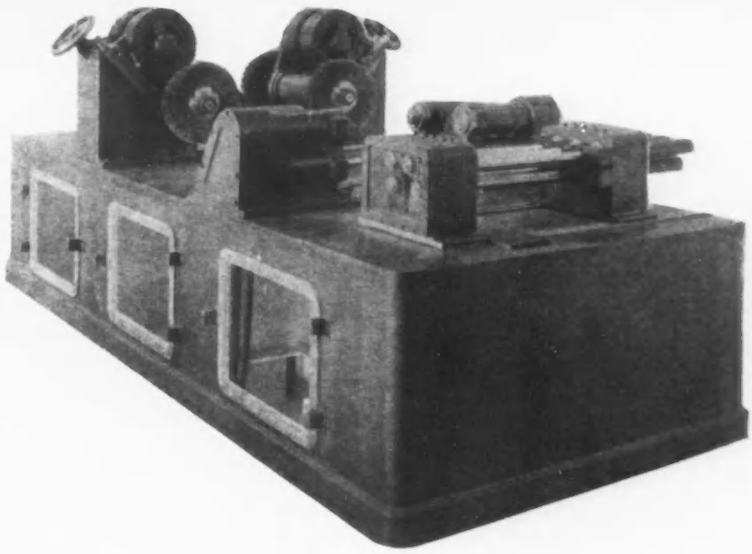


FIG. 1.—Welded Steel Was Used in Building This 8-Ft. Diameter Indexing Table Designed to Carry Jigs for Work Done at Three Different Stations. Production of six pieces a minute is required and so the table must be indexed 18 times a minute. To get the necessary stiffness and sufficient wall thickness, this table, if of cast construction, would be too heavy to index at the speed required without the use of accessory equipment to accelerate and decelerate. Built of welded steel, thoroughly braced and ribbed, and carried by a Timken precision roller bearing, the table can be turned readily with one finger

FIG. 2.—This Special Milling Machine Combines Welded and Cast Construction. The base, hydraulic platen or table, hydraulic vises, hold-downs and milling arbors are of welded steel, but because the same set of patterns could be used for both the right and left-hand head and tailstocks, steel castings were used for those parts. The tailstock castings are electrically welded to the tubular overarms that tie the head and tailstock together

FIG. 3.—(Below) Welded Steel Was Used Economically in This Machine, Especially for the Overarm Supporting the Wire Straightener, the Rack Frame Guides and Gear Boxes. The machine was designed for feeding wire, straightening and cutting it to length and welding it to form the rectangular oven rack for gas ranges. The door frames and doors and the two handwheels shown on the machine are castings



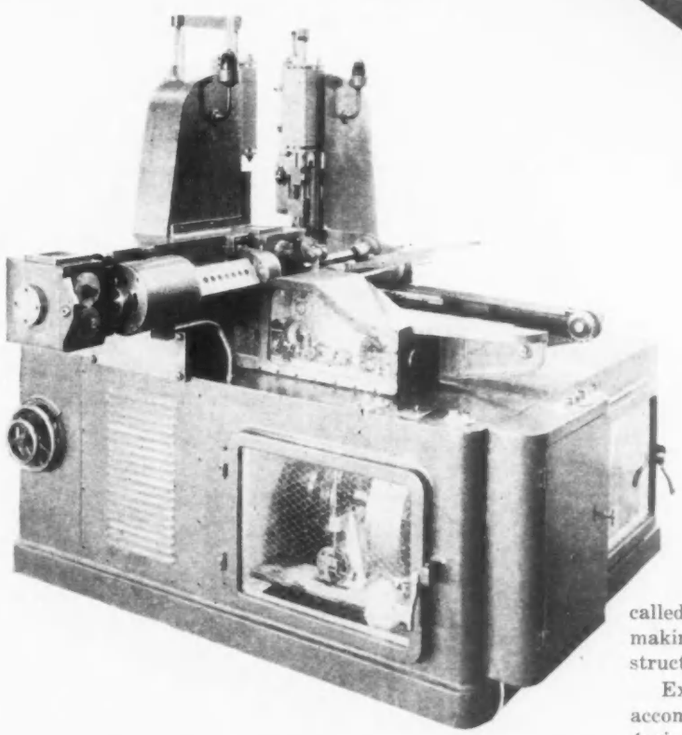


FIG. 4.—(Above) The Welded Steel Base of This Machine, for Finishing Operations on the Gas Range Oven Racks, is 5-Ft. Wide and 12-Ft. Long. Of welded steel also are the gear boxes that support the roll straightener, the housings and parts, and the rotary shear. The two triangular base supports for the wire brushes are identical in design and were therefore made of castings. The door frames being of standard size are of cast steel, welded into holes burned into the steel plates

patterns and core boxes as it does to perform the welding operations on the machine itself. Patterns deteriorate rapidly, require fire-proof storage, and unless another machine is going to be built from the same pattern within six or eight months, patterns can be eliminated with considerable speeding up in production and a reduction in the weight and cost of the material. Other advantages include increased stiffness and strength, smoother finish, requiring less paint, and the elimination of the necessity for "aging" the material.

In developing a standard machine of new design, welded-steel construction offers the same advantages. In addition, it permits the welding on of brackets and pads and the making of changes without scrapping and remaking the patterns and castings. Having completed the development work and having determined just how the proposed machine will function, it is, of course, more economical to put the machine into patterns and get the castings in the regular way. Modern heat-treating largely takes care of the aging problem.

When a large machine tool is to be built only two or three times a year, deterioration and repairs to patterns become quite costly. Large castings are relatively hard to handle and of necessity must be thicker, hence heavier and more costly, in order to obtain the same strength as with the steel construction. With very large equipment of this class, changes in design are frequently called for to fit the machine to particular requirements making it necessary to add considerable pattern construction to the job.

Examples of welded-steel construction are shown in the accompanying illustrations. Fig. 1 is an 8-ft. diameter indexing table; Fig. 2, a special milling machine representing a combination of cast and welded-construction; and Fig. 3 is a machine for feeding wire, straightening and cutting it to length and finally welding it into a rectangular gas range oven rack. Fig 4 is a machine for finishing operations on the gas stove oven-racks. The captions for these illustrations give further data on each machine.

In building these machine bases, the plates are planed and scarfed on a plate planer. The molding around the base is also planed and one edge rounded, on the plate planer. All welds are caulked immediately after welding to remove any strains that may be set up by the welding heat. We find no difficulty in obtaining welds free from porosity, and have never had a weld fail.

Proper equipment, proper welding wire and a high-grade experienced welder are the prime essentials to success in obtaining good welded steel construction.

A directory of mine operators and statistical data pertaining to shipments of iron ore are contained in a booklet published by the Lake Superior Iron Ore Association, Cleveland. Included in the data are annual shipments from each mine in the period 1909-1928 inclusive, annual receipts at lake ports, ore on dock at Lake Erie ports, annual shipments from other than Lake Superior mines and annual imports by countries.

New Low-Sulphur Iron for Ingot Molds

Effort to Avoid Cracking of Molds from Sudden Expansion and Slower Contraction—Oxides Blamed for Permanent Growth

DEVELOPMENT of an ingot mold iron to resist, as much as possible, the failure of molds through heat checking and cracking has been the purpose of the Vulcan Mold & Iron Co., Latrobe, Pa., in bringing out a new metal which is designated as Vulc-Iron. Specializing particularly in the ingot mold requirements of tool, alloy and other high-grade steel producers, the company has used cupola-melted, rather than direct-metal, iron in casting its molds, to obtain a smooth surface and also to minimize cracking from the wide temperature fluctuations during the early life of the mold.

Development of Vulc-Iron is the culmination of several years of experimenting to determine the cause of heat-checking in ingot molds, and the entire output of the company is now being made of this metal.

Causes of Heat-Checking

Cast iron, as is now generally known, is made up of steel matrices interspersed with graphite flakes. During the heating and cooling that an ingot mold undergoes in service, the cast iron expands and contracts according to the heat laws. As the coefficient of expansion of the steel matrix is higher than that of the graphite, the steel expands more rapidly, leaving a cavity around each graphite flake. Near the surface of the mold these cavities will permit oxygen and other gases to penetrate and oxidation takes place at or near the surface of the mold.

Photomicrographs clearly show evidence of oxides surrounding the graphite flakes. These oxides, being of greater volume than the elements oxidized, partially fill the cavity formed during the expansion that takes place when the hot metal is poured into the mold; when the mold cools and contraction occurs, the metal cannot shrink back to the original volume. A permanent growth of the iron is recorded, this apparently being the cause of a large percentage of the failures in molds.

Controls Size and Distribution of Graphite

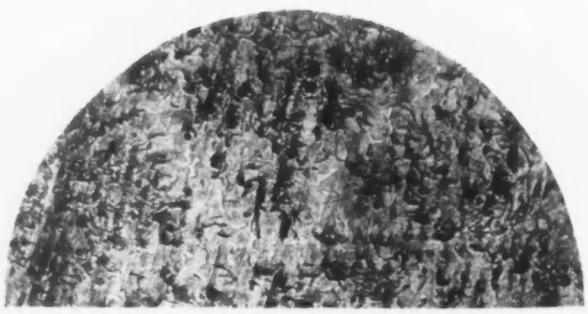
Checking of this growth of the ingot mold metal during cooling has been attempted in Vulc-Iron by reducing the number of graphite flakes in the iron and by making them smaller and more rounded in form. This would also bring about a lessening of the distance between the graphite flakes and reduce the penetration of oxygen by stopping the open paths used by the gases.

Accompanying photomicrographs show the difference in structure between Vulc-Iron and ordinary cupola cast iron. Tests of molds in service have shown the growth-resisting qualities of the former and the consequent reduced fire cracking.

High percentages of sulphur in cast iron tend to increase its brittleness and lead to cracking at both high and low temperatures. Hence, Vulc-Iron is treated to reduce its sulphur content. It averages 0.035 per cent sulphur, and is guaranteed under 0.05 per cent sulphur. Only Bessemer iron is used in the cupola, with a percentage of low-phosphorous steel scrap and of cast iron scrap, the latter entirely of the company's old molds, returned for this purpose. Washed coke is burned in the cupola and desulphurizer is used freely.

Improved Service Demonstrated

Tests of the molds in plants show an average improvement in service of about 25 per cent over regular or direct metal ingot mold iron. In a number of cases it has been found practical to reduce the wall thicknesses of molds by the use of this metal, without allowing them to fail by breaking or cracking. As a good many molds in use today have a greater wall thickness than is necessary to produce the required amount of chill on the ingots, the excess thickness being required to prevent cracking or breaking, efforts are being made to develop the po-



DIFFERENCE in Structure of Vulc-Iron (upper) and Ordinary Cupola Cast Iron (lower) Is Shown in the Photomicrographs, Magnified 100 Times. In the Vulc-Iron, the graphite flakes are greatly reduced in size, providing a much finer granular structure

tentialities of Vulc-Iron to the fullest extent in this direction.

It is believed also that this metal may provide sufficient strength in the mold wall to resist cracking without a redesigning of molds in cases when molds are not strong enough to withstand the sudden expansion occasioned by the pouring of the steel.

New All-Metal Construction Principle

Portable Buildings Put Together With Special Key Device—Some Electric Welding Done

BY R. A. DADISMAN*

IN the wake of the all-metal house movement comes a new development in portable all-metal building construction, conceived and designed for the White Castle System, Inc., Wichita, Kan., by Lloyd W. Ray of their construction department. This suggests the possible application of the idea to other types of commercial and industrial buildings.

No rivets are used in the construction of the supporting structure or the inside or outside surface joints, and yet the building can be knocked down and reassembled in a few days, with no tools except a pair of pliers, a wrench and a screw driver. The entire structure with interior fixtures in place weighs about 8000 lb.

The White Castles are fireproof, are protected inside and out from deteriorating weather conditions, and can be initially built for about one-fourth less cost than the glazed brick buildings formerly used by this company. So versatile is this new type of construction that the building will fit a variety of corner sites. This is because the doorways and doors are interchangeable, so that the door may be placed at the end or the side, and it can swing open to the right or left, without any change in specifications.

For several years the White Castle System had been searching for a movable, attractive and sturdy type of all-metal construction which would replace the brick structures in use for the company's chain of stands. The only thing to be had was constructed in the traditional manner, riveted together, so that it was practically impossible to move it economically. And there were exposed rivet and bolt heads, and it could not take the attractive finish so much desired. The key to the problem was really a mechanical key—a locking device which eliminated the use of rivets or bolts, and was completely hidden from view. And yet it bound together the proposed all-metal building as solidly as the best hammered rivet might have done.

Since there were no dies in existence for making the steel studding to meet the specifications, the entire job had to be done from the ground up. In Fig. 1, showing the assembled superstructure, the eight sections composing this framework are indicated by vertical lines on both the lower and the upper track. Each corner is a section, with an intermediate section in the front, at the rear, and at each end. Each section is built up by welding the studding into the upper and lower track. Only two sizes of steel studding are used.

Frames for windows, doors and transoms are bolted in and easily removable, so as to fit the specific needs of the ultimate location of the building. The only wood used is a "breaker" of wood strips on the inside of the studding. This serves as an insulator between the two sheetings, eliminating actual metal contact between exterior and interior of the building, further insulating against the weather and preventing the possibility of "sweating."

How the interior and exterior porcelain-enameled Armco ingot iron sheets are secured without the use of

*American Rolling Mill Co., Middletown, Ohio.

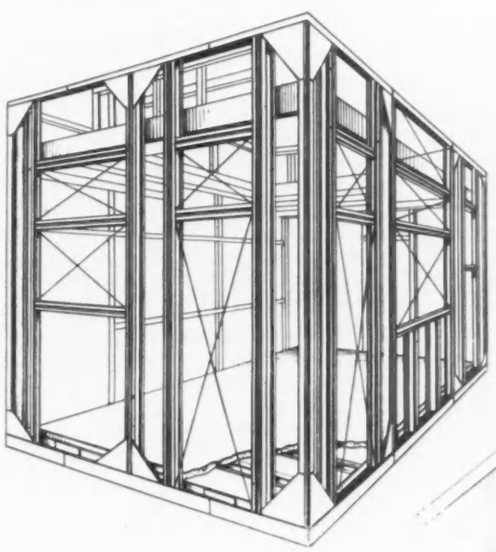


FIG. 1

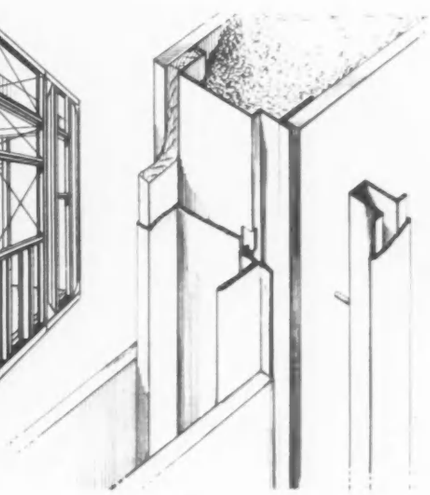


FIG. 2

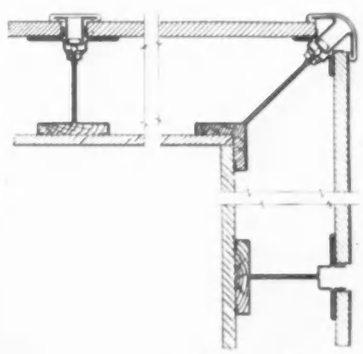


FIG. 3

FIG. 4

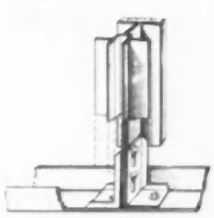


FIG. 5

rivets, bolts or other methods commonly used in metal construction is shown in the cross-section view of studding, Fig. 2. Exterior sheets are secured to the studding by a locking key as shown at right in Fig. 2. The key cover, built to fit snugly over the flanges of the key, is also porcelain enameled, leaving the exterior of the building without any evidence of the manner of fastening the sheets to the framework.

Interior sheets are cut so that they meet at the wood strips inserted in the studding, and are secured by screws directly into the wood. Joints between sheets are then covered with a nickel molding strip, also screwed into the wood. Insulation in the 4-in. space between exterior and interior walls, shown in Fig. 2, is asbestos rock wool.

Final assembly of all these units of construction is shown in the cross section view, Fig. 3. How the key appears when set in place is shown in the upper left and at the corner section in this drawing. Fig. 4 shows the method of securing the movable and interchangeable framework for doors, windows and transoms.

Ascendency of Alloy Iron Castings

Automobile Companies the Largest Users—Great Deal Made from Mayari Pig Iron—Output in 1928 Over 700,000 Tons

BY EDWIN F. CONE

IN a survey of the alloy iron casting industry of the United States, entitled "Ascendency of Alloy Iron Castings," published in THE IRON AGE, March 28, pages 861 to 863 and 924, it was promised that a brief supplementary article would be published later because further returns from the questionnaire were expected. In the following paragraphs some pertinent facts, not ascertained up to the time the earlier data were analyzed, have been furnished by a few other producers of alloy gray iron castings.

The original questionnaire had been sent to 3813 foundries. At the time that article was written, replies had been received from about 1900 producers, or nearly one-half of all of them. Since then the number has expanded to 1988. It is assumed that practically none of the 1825 silent foundries make alloy gray iron.

Large Tonnage Used by Automobiles

An interesting feature of the use of alloy gray iron castings is their application to automobiles. Nearly 30 leading automobile makers were canvassed and of these 22 were heard from directly. Fifteen manufacturers do not make their own iron castings. One automobile maker who uses nickel-chromium cylinder heads and other castings on a large scale did not reply. Estimating that company's production and adding it to the output of the companies which gave their production, there was produced in 1928, by automobile companies having their own foundries, approximately 200,000 tons of alloy gray iron castings, containing either nickel alone or nickel and chromium. The large part of this total was made by the use of Mayari pig iron. It is of interest to note that one maker of a leading high-priced automobile made over 14,000 tons of semi-steel castings, principally cylinder blocks and cylinder heads.

Another large outlet for alloy iron castings is in the form of rolls for various types of rolling mills. Replies from seven companies producing such rolls containing nickel, chromium or molybdenum, or combinations of these, indicate that about 15,000 tons was made in 1928 by these companies.

Wide Use of Mayari Pig Iron

Due to some misunderstanding of the original questionnaire, a large number of makers of nickel-chromium castings did not report the sources of the nickel and chromium. It develops that a larger proportion of this grade of iron castings is made by the use of Mayari pig iron than was at first suspected. According to data furnished by the Bethlehem Steel Corporation, approximately 600,000 tons of gray iron castings were made from Mayari pig iron sold by that company in 1928, the castings containing widely varying percentages of nickel and chromium and the uses to which they are put being also very much diversified.

In this connection attention is called to the fact that the use of nickel in cast iron was suggested as early as 1858 by Sir William Fairbairn. Its essential benefits to gray iron were described by Guillet in 1907. No industrial development, however, took place based upon the experiments of these two pioneers, on account of the high cost.

Early in 1912 the Pennsylvania Steel Co. experimented with a Cuban ore and made a number of tests of iron containing varying amounts of nickel and chromium. In the same year the Reading Iron Co., Reading, Pa., purchased some Mayari pig iron for pipe balls. Attention was attracted to the wear-resisting properties of these balls. Other tests were made by S. Jarvis Adams, and in 1913 J. Ramsay Spear was granted a patent covering the use of these alloys. Mayari pig iron was coming into use in the making of rolls for steel mills at that time.

Purchase of the Pennsylvania Steel Co. by the Bethlehem Steel Co., in July, 1916, placed the Mayari properties in the latter's possession. The Bethlehem company began actively to develop this special grade of pig iron into a commercial product. Up to that time only six or seven firms were using it and only in the low-silicon grades for wear-resisting uses; it was during the post-war depression, or from 1919 to 1921, before the commercial application of nickel was advised for use in gray iron castings. Mayari pig iron, by this time, it is stated, had been used by many foundries interested in improving their product, but development was slow until the motor car makers began to use it in quantities in an effort to produce better cylinder blocks. Today, as the above survey indicates, this iron is used by a large number of American automobile manufacturers, and also by European car makers.

Opinions of Foundrymen

Supplementing some of the views of various foundries, given in the original article, the following are important:

One company in the East states that in 1928 it made a large tonnage of vanadium iron castings, for "use in machinery in places where superior tensile strength is required and where a casting has to withstand friction, such

as cams, etc., and for extrusion, tool and die purposes, where it is essential that the metal will not run nor score. Castings are heat treated in such cases where they must be a little softer than in the natural condition."

A large railroad, which has its own foundry, says that its output of over 1150 tons last year was made with a mixture of two grades of pig iron, two grades of scrap iron, four grades of scrap steel, ferromanganese and No. 44 nickel alloy. "Fifty per cent of this tonnage was a high-grade alloyed iron for locomotive cylinders, cylinder bushings, cylinder packings, valve bushings, valve packings, piston heads, valve rings, piston bull rings, and other locomotive parts."

A large foundry and machine company reports that last year it made about 200 tons per month of molybdenum and other alloy iron rolls.

Significant information comes from a producer, on a large scale, of corrosion-resisting cast iron pipe and sections made from nickel-chromium alloy iron, meaning evidently Mayari pig iron. The metal was produced in two cupolas, one of the conventional design and the other fired by powdered coal, the iron being superheated in both units.

A maker of one of the leading high-grade automobiles estimates that he produced, last year, about 5000 tons of cylinder block castings containing from 1.25 to 1.50 per cent nickel, about 1000 tons of pistons containing 1 per cent nickel, and one or two smaller jobs of about 500 tons, in which 1 per cent nickel was used.

A Western company, which produces agricultural implements, offers the following testimony: "We have just recently been experimenting with the use of nickel and chromium in our iron castings. We have not progressed far enough to give any definite information, other than that we receive fairly good results with the use of these two alloys in castings for cylinder heads and gears."

From a company located in the Eastern States, the following experience in making and testing alloy gray iron castings is reported:

> From two test pieces that were made in our foundry, using alloys, the piece tested was cast as a riser on a casting. The first castings weighed approximately 500 lb. and were rather chunky. They were cast from a mixture consisting of 20 per cent foundry pig iron (silicon 2.01 per cent), 40 per cent cast scrap and sprues and 40 per cent steel scrap. The analysis was:
>
> | | | |
> |---|---|---|
> | Total carbon | 3.45 | per cent |
> | Phosphorus | 0.396 | per cent |
> | Manganese | 0.58 | per cent |
> | Sulphur | 0.116 | per cent |
> | Silicon | 1.43 | per cent |
> | Nickel | 0.81 | per cent |
> | Chromium | 0.14 | per cent |
>
> Nickel and chromium used in ladle.
> Tensile strength 36,500 lb. per sq. in.
>
> The second castings weighed approximately 1500 lb. each and were complicated with a lot of cores and sections from ½ in. up to 1¾ in. thick. They were cast from a mixture consisting of 37 per cent foundry pig iron, 3 per cent Mayari pig iron, 50 per cent cast scrap and sprues, and 10 per cent steel scrap; 1 per cent nickel was added in ladle. The analysis was:
>
> | | | |
> |---|---|---|
> | Total carbon | 2.80 | per cent |
> | Phosphorus | 0.176 | per cent |
> | Manganese | 0.62 | per cent |
> | Sulphur | 0.14 | per cent |
> | Silicon | 1.40 | per cent |
> | Nickel | 1.36 | per cent |
> | Chromium | 0.09 | per cent |
>
> Tensile strength, 33,800 lb. per sq. in.
> Brinell hardness, 90.
>
> This last casting was a lathe bed. The report from the machine shop was that it machined a little hard but always showed up fine.

A revision of the table of output of alloy iron castings, by States, published in the original article, accompanies this article. It shows that reports from 39 States indicated an output in 1928 of about 299,500 gross tons. Added to this an estimated tonnage of 400,000 tons from companies not heard from, and based mainly on the known uses of Mayari pig iron by a diversified number of companies, the total alloy iron output in 1928 was approximately 700,000 tons.

Output of Alloy Gray Iron Castings by States in Tons in 1928

Alabama	1,919	Nebraska	300
California	590	New Jersey	5,171
Colorado	22	New York	5,275
Connecticut	3,410	Ohio	9,283
Delaware	7,500	Oklahoma	150
Florida	2	Oregon	249
Georgia	788	Pennsylvania	36,305
Illinois	7,848	Rhode Island	300
Indiana	19,673	South Carolina	35
Iowa	3,840	South Dakota	5
Kansas	2,500	Tennessee	100
Kentucky	85	Texas	295
Louisiana	20	Utah	70
Maine	78	Vermont	1,200
Maryland	50	Virginia	5
Massachusetts	10,266	West Virginia	1,927
Michigan	158,120	Washington	706
Minnesota	6,575	Wisconsin	9,196
Missouri	1,250		
Montana	4,401	Total	299,509

Total Alloy Iron Output in 1928, 700,000

Large Assortments of Bolts and Nuts Make Warehousing a Difficult Problem

BECAUSE of the multiplicity of sizes and types which must be carried in stock, the warehousing of bolts and nuts is one of the most difficult problems for the manufacturer of these products. At the Lebanon, Pa., plant of the Bethlehem Steel Co., for example, about 12,000 tons of these products and 3000 different items are nearly always carried in stock. These bolts and nuts are stored in bins of varying sizes, some holding as much as 80,000 lb. each. Kegs of bolts and nuts are packed through openings in the bottoms of these bins. Skilled workers assemble as many as 1100 kegs a day, based on standard size No. 12½ keg, which means the handling of more than 15,000 pieces a day. The orderly and convenient arrangement of the Bethlehem bolt and nut warehouse is shown by the illustration of one bay of a building 200 x 675 ft. used for bolts and nuts only.

Hot-Metal Ladle of Spherical Shape

Many Advantages Claimed for New Type of Container—Greater Capacity Without Excessive Weight

REDUCTION to a minimum of radiating surface in a hot-metal ladle is accomplished in a 70-ton spherical-shaped ladle which has been developed by F. F. Kling, chief engineer, Youngstown works, Carnegie Steel Co. It is now being successfully used at that plant in transferring hot metal from the blast furnaces to the mixers. A number of these ladles are being introduced at the Mingo, Ohio, works of the Carnegie company also and others are being built by William B. Pollock Co., Youngstown, for a Canadian steel company.

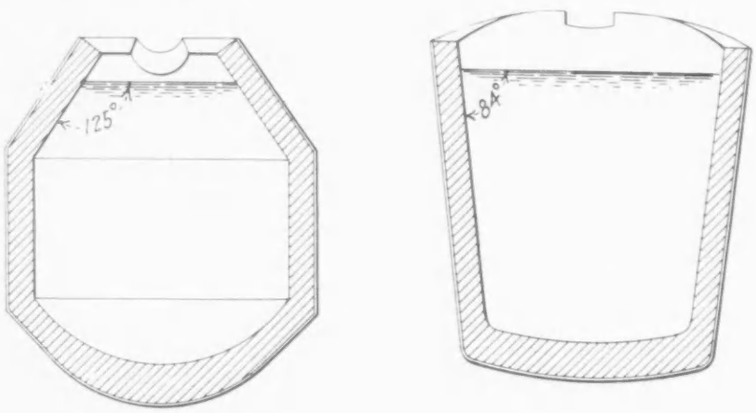
As shown in the illustration, the shape of the ladle represents a decided departure from the usual type, and the center of gravity of the metal is low. Splashing in transit is practically eliminated. The ladle is of strong construction and comparatively light in weight. It can be lifted from the car in pouring, or can be poured directly from the car, and a transfer ladle is unnecessary in pouring the hot metal into the mixer.

Ladle trunnion bushings rotate on the self-lubricating brass sleeves, thus preventing wear on the trunnions, as well as on the crane hooks. Self-lubricating bushings have been provided also on the pin which the auxiliary hook of the crane, or the hook of the pig casting machine hoist, engages when turning the ladle over.

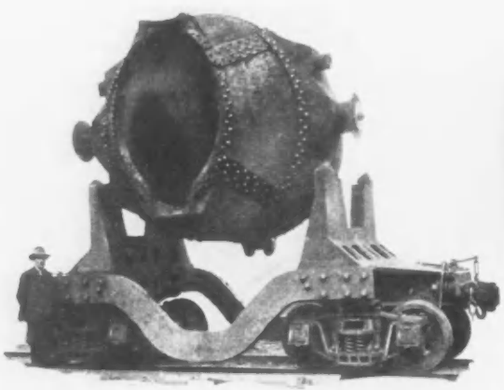
The ladle car is of substantial construction and, because of its shortness in proportion to capacity, requires little track space. The car frames which tie the trucks together are made of 6-in. x 15-in. rolled steel slabs of high tensile strength. Self-lubricating brass washers are used on top of the centerplates of the truck bolsters, reducing wear at this point and enabling the trucks to turn easily when going around curves. The cars are equipped with draft gears and, as a safety measure, heavy safety chains backed up by springs are provided.

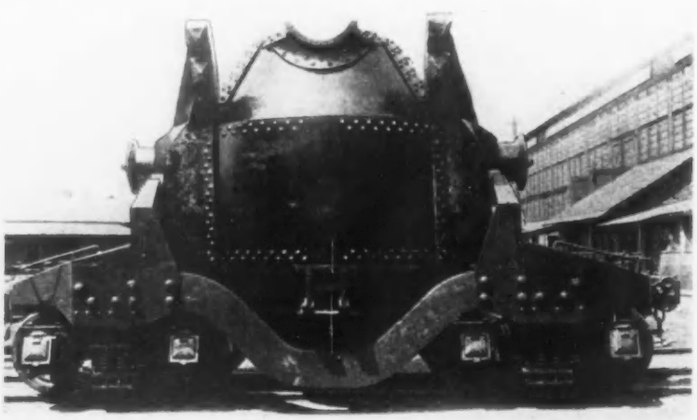
The Kling ladle and car may be used satisfactorily on 85-lb. rails, and trestles of usual design are strong enough to support it. Removing kish is accomplished by dumping into a box or cinder pot immediately after the iron has been poured into the mixer; it does not have to be scraped out of ladle. New lining may be put in without the use of arch supports.

In comparison with the old 20-ton ladle, the Kling type keeps the metal hot longer, and runner scrap and used ingot molds can be melted in the ladle. With hotter iron the mixers do not skull, and considerably more scrap can be used in the converters. Skull in the ladle is practically eliminated, with the exception of a small growth of kish in the spout, which is removed twice a week. Fewer men are required in the cast houses and ladle house with the larger ladle, and men are saved in cleaning ladles.



SECTION of the Kling Ladle, Compared with a Ladle of Conventional Design and Same Capacity, Shows Reduction in Exposed Surface of Metal





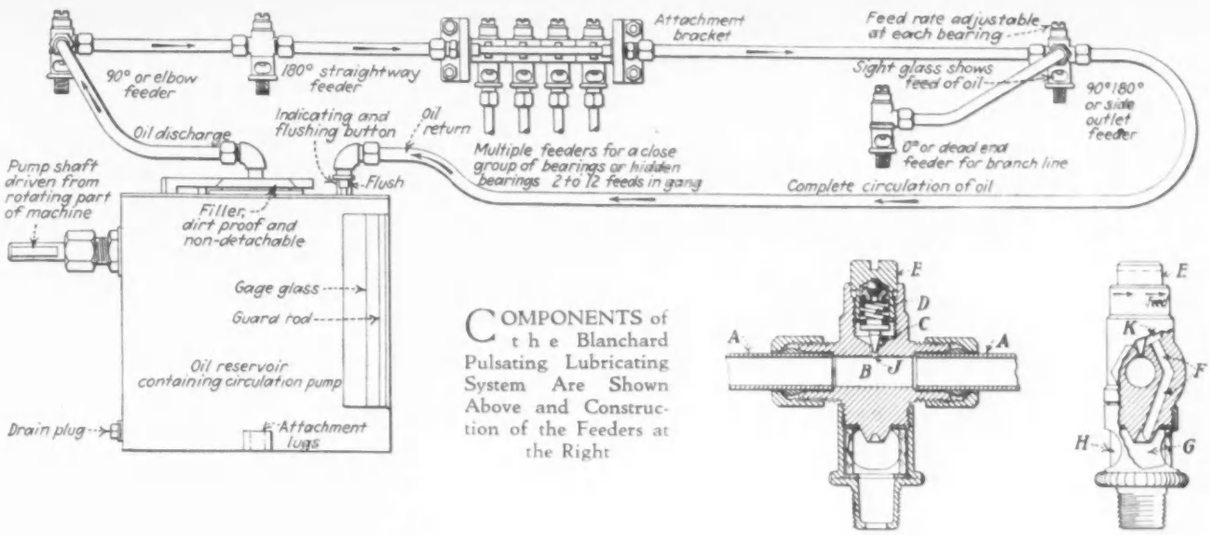
SHORTNESS for Its Capacity Features This Ladle Car. The tilted ladle (unlined) well shows its shape and other characteristics

Range Boilers and Expansion Tanks

Simplified Practice Recommendation R8-29 relates to range boilers and expansion tanks. This has been put out by the United States Bureau of Standards. It covers 13 sizes of range boilers and six sizes of expansion tanks. The pamphlet describing it gives some details as to both together with illustrations. Copies may be obtained for 10c. from the Government Printing Office, Washington.

Wrought Iron Pipe Nipples

Commercial Standard CS 6-29, covering wrought iron pipe nipples, has been promulgated by the United States Bureau of Standards. It gives tables of the standards adopted for different sizes of pipe, and different weights, including stock lengths and taper thread dimensions. The pamphlet, which may be obtained for 10c. from the Superintendent of Documents, Government Printing Office, Washington, gives details also as to the membership of the conference at which the standards were tentatively adopted.


90° or elbow feeder
180° straightway feeder
Attachment bracket
Feed rate adjustable at each bearing
Sight glass shows feed of oil
90°180° or side outlet feeder
Oil discharge
Indicating and flushing button
Oil return
0° or dead end feeder for branch line
Pump shaft driven from rotating part of machine
Flush
Multiple feeders for a close group of bearings or hidden bearings 2 to 12 feeds in gang
Complete circulation of oil
Filler, dirt proof and non-detachable
Gage glass
Guard rod
Oil reservoir containing circulation pump
Drain plug
Attachment lugs

COMPONENTS of the Blanchard Pulsating Lubricating System Are Shown Above and Construction of the Feeders at the Right

Lubricating System Provides Wide Range of Feed Rates

FROM five to 100 feeders may be supplied automatically with clean oil in individually predetermined amounts by means of the Blanchard pulsating lubricating system illustrated, which is manufactured by the Rivett Lathe & Grinder Corporation, Boston. In addition to flexibility, simplicity and economy are claimed for this centralized oiling system.

An oil reservoir, pump, pressure control valve, single circuit pipe line and feeders, single or in gang, at each bearing comprise the system. Oil is pumped constantly through the circuit at a pressure of about 10 lb. for 95 per cent of the cycle and at 50 to 60 lb. during the remainder of the cycle. This intermittent stepping-up of pressure, through the pressure control valve, serves to lift the needle of each feeder from its seat and admit oil to the bearings. The feeders are spring loaded and may be adjusted over a wide range to permit a feed as low as two or three drops an hour and as high as a small stream at each pulsation. Visible indication of the working of the entire system is provided through the pulsating action of a flush plunger located on the reservoir and a sight glass on each feeder. Oil supply in the reservoir is indicated by a gage glass.

Pumping of oil begins and stops with the machine and the rate of delivery is proportional to the speed of the machine. When unusually cold starting conditions are encountered, the system may be flushed by pressing down the flush plunger on the reservoir. Light or heavy oil of suitable grades may be used. After the initial adjustments of the feeders, the system requires no further attention other than replenishing the reservoir, which holds 3 qt.

The oil reservoir contains the pump and pressure control valve, and may be mounted on the machine or near it, with the pump shaft belted or geared to any rotating member. It is equipped with a permanently attached filler cap, a screened filler opening and a drain plug at the bottom. The pump is a double-plunger unit with piston valves and can be driven in either direction, or reversing. Neither ball nor check valves are employed. The oil intake to the pump is equipped with an accessible fine-mesh screen, providing double filtering of the oil. The pressure control valve is of rotating-plate type and is driven by worm and gear from the pump shaft. Connected with the moving part of this valve and located above the cover of the reservoir is the flush button, which, in making a jump at each pressure pulsation, gives visible indication of the working of the system.

The individual feeders provided at each lubricating point are made in a variety of external forms to facilitate application and piping arrangements. From the line sketch it will be seen that the passage *B* through the feeder is part of the oil circulation line *A A*. The oil flows through *B* under low pressure except when pulsation occurs, when the momentary kick, acting through the passage *J*, lifts the needle *C* from its seat against the adjustable loading of spring *D*, and admits a particle of oil. When the pulsation ceases the needle instantly reseats.

Oil thus taken from the circulation line collects in the chamber *K*, flows down through the passage *F* and drips off the nozzle *G*, the flow being visible through the glass at *H*. Adjustment of the oil supply to the bearing is made through screw *E*, which when turned to the left increases the rate of feed, and when turned to the right, decreases it.

The jump of the needle overcomes any tendency of the oil to film over the feed opening. This opening is located above the circulation line to obviate entrance of foreign matter; the grit or dirt falls back into the line and is carried by the oil stream to the reservoir to be filtered out.

High-Speed Rotor Grinder for Die and Pattern Work

A DIE grinder that is claimed to develop more than ½ hp. at 13,000 r.p.m., which power and speed adapt the machine for smooth clean work with small wheels and points, is being placed on the market by the Rotor Air Tool Co., Cleveland.

The tool is designed to use 1½-in. vitrified wheels, 2½-in. high-speed wheels and ½-in. pencils. It was developed for grinding dies, metal patterns and for use in brass, bronze and aluminum foundries for finish grinding of castings and for scroll work on ornamental pieces. The machine is of simple design and light in weight. A wheel arbor for wheels having a ⅜-in. hole, ⅜ in. wide, is regularly furnished, but arbors for ¼ and ½-in. holes are available as extras. Accessory equipment includes a collet for holding a ¼-in. shank for mounting small wheels and for holding pencil sticks. The same collet may be used for holding a variety of points for special work.

More Than ½ Hp. Is Developed at 13,000 R.P.M.

Trade Rules for Scrap Industry Approved

Federal Commission Accepts Code With Minor Changes —Scrap Institute Sets Up Bureau to Aid in Enforcing Rules

WASHINGTON, July 30. — Rules of conduct for the scrap iron and steel industry were officially promulgated by the Federal Trade Commission last Friday. They are the outgrowth of rules adopted at a conference held at Pittsburgh on May 23 under the direction of Commissioner Garland S. Ferguson, Jr., assisted by M. Markham Flannery, director of trade practice conferences. Except for the omission of the resolution governing compliance with the rules, one minor amendment and rearrangement of the rules into Groups I and II, those announced by the commission appear in the same form as those adopted by the industry and published in THE IRON AGE of May 30, pages 1497-98. The eliminated resolution provided that all violations of the rules be referred "in the first instance to the Institute of Scrap Iron and Steel, Inc., for investigation and adjustment." The amendment directed by the commission substituted the word "misleading" for the word "indefinite" preceding the word "language" in the rule relating to price quotations.

Group I rules are those affirmatively approved by the commission, while Group II rules are accepted by the commission as expressions of the trade. In Group I the commission has included six rules, covering "top dressing" of cars, defamation of competitors, price quotations, interference with contracts, commercial bribery and fictitious bills of lading. Group II also includes six rules, which concern overbilling of cars, arbitration, cost accounting, overweights, failure to fulfill orders and continuance of conference.

A Trade Relations Bureau has been set up in the Institute of Scrap Iron and Steel, Inc., to investigate complaints and assist in the enforcement of the code of business practices, Benjamin Schwartz, director general of the institute, announced following the action of the Federal Trade Commission. It is planned to have special chapter committees appointed to investigate complaints, in the first instance, in the territories covered by the 12 chapters of the institute. The Trade Relations Bureau will receive reports, will conduct supplementary investigations, if necessary, and will make recommendations as to the disposition of each case. The following statement was issued by the Trade Relations Bureau, with the approval of Mr. Schwartz:

The date on which these resolutions become effective is July 26, on which the commission published its official report. The grouping of the resolutions in two groups is a technical proceeding, and does not affect the merits or the effectiveness of the resolutions. The resolutions that are approved by the commission are binding on the entire industry, whether members sign them or not. It is, however, understood that the Federal Trade Commission requests the business men of an industry to sign the resolutions, as a means of ascertaining who will cooperate with the commission.

The single resolution that was disapproved by the commission does not concern a trade practice, but deals with the matter of enforcement. In view of the policy of the Federal Trade Commission to look to an industry for the enforcement of its own code, a resolution to that effect does not require approval by the commission. In line with this policy, a Trade Relations Bureau has been established by the institute.

The following resolution was adopted by the executive committee of the institute at its last meeting:

Whereas, compliance with these rules is essentially a matter for the industry, itself, and whereas, it is desirable that outside agencies of enforcement should be used as a last resort and that violations be adjusted expeditiously and without notoriety within the industry, therefore be it resolved: that it is the sense of this conference that all violations of these rules be referred in the first instance to the Institute of Scrap Iron and Steel, Inc., for investigation and adjustment.

The Trade Relations Committee is composed of the following: Charles Dreifus, Pittsburgh, chairman; Charles Bock, Buffalo, co-chairman; Joel Claster, Reading, Pa.; Harry Ehrlich, Springfield, Mass.; Joseph G. Hitner, Philadelphia; Herman D. Moskowitz, New York; John R. Briggs, Philadelphia; George B. Doane, Boston; Ben Cohen, Wilkes-Barre, Pa.; Joseph Maher, Buffalo; Carl R. Briggs, Blue Island, Ill.; Samuel N. Summer, Columbus, Ohio, and Morris Speer, Cleveland. Joseph Colvin will be secretary of the Trade Relations Bureau.

Recoveries of Non-Ferrous Metals Larger

WASHINGTON, July 30.—Showing an increase of $21,271,500 over 1927, the value of certain non-ferrous metals recovered from secondary sources in 1928 has been reported to the Bureau of Mines as $277,623,500. According to J. P. Dunlop, who compiled the figures, the increase in total value was due mainly to larger recoveries of copper, brass, lead and nickel and to the higher average price of copper in 1928, for the average prices of lead, zinc, and tin were considerably less in 1928 than in 1927. There were large gains in the quantity of secondary copper, lead and nickel in 1928, small increases in secondary zinc and aluminum and small decreases in tin and antimony. The quantity of copper, including that in brass, increased more than 46,000 tons.

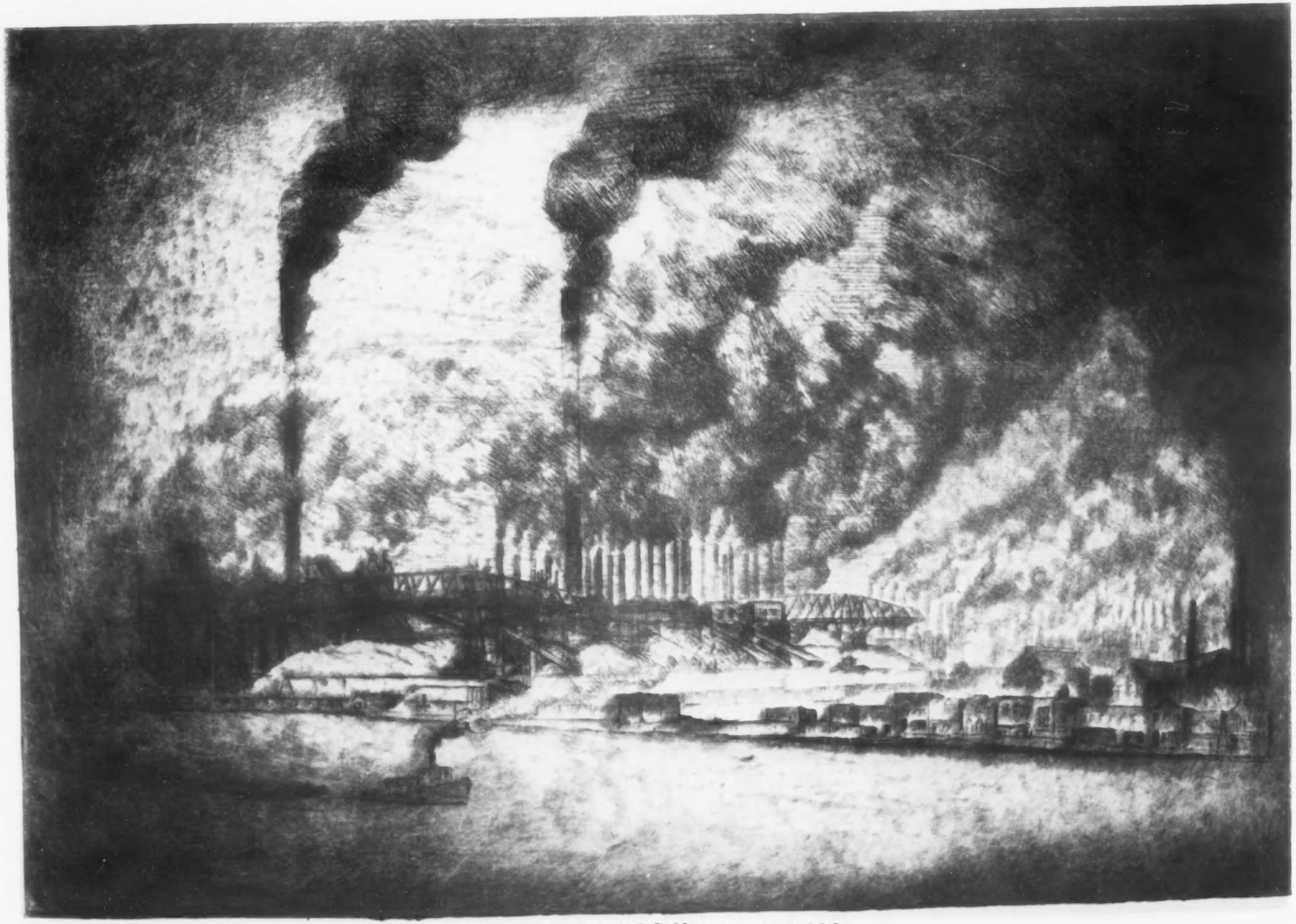
There was a continuation of large shipments of scrap copper and brass to Europe. In 1927 the combined exports were 68,706, net tons and last year they were 70,146 tons. The combined imports of copper scrap and brass scrap in 1928 were about 11,400 tons, mainly from Canada and Latin America. The main increase in lead was in the output of secondary pig lead by smelters which treat mainly ore. The increase at these plants was about 17,500 tons, while at regular secondary plants it was only about 1500 tons. Secondary lead recovered in alloys increased 13,600 tons. Zinc recovered by redistillation increased nearly 6000 tons, while that recovered by sweating and remelting was about the same in 1928 as in 1927. Exports of zinc dross decreased 1300 tons, but the quantity used in zinc dust, lithopone, and zinc chloride increased about 9000 tons.

Detinning plants treated a larger quantity of clean tin plate clippings in 1928 than in 1927, but the recovery from such clippings was less. It is reasonable to assume, according to Mr. Dunlop, that the efficiency of detinning plants has not decreased in the last 10 years, yet the yield of tin per gross ton of tin plate clippings, according to reports filed with the Bureau of Mines, has declined from 36.27 lb. in 1918 to 30.3 lb. in 1928. Only a few old tin coated containers were treated last year, for the much lower prices of tin made the handling of them unprofitable. About two-thirds of the recoveries at detinning plants were as tin content in tin tetrachloride and tin oxide.

The report stated that profits in most lines of secondary metal recovery were larger in 1928 than for several years, and operations were on a sounder and less speculative basis. The range in metal prices was not large and secondary metal dealers and smelters relied more on ordinary profits of buying and selling. Mr. Dunlop said that there seems to be need of improved business methods, since profit in handling certain scrap metals and drosses is said to be very small.

More Coke Ovens in Boston Region

The New England Coal & Coke Co., Everett, Mass., a subsidiary of the Massachusetts Gas Co., has contracted with the Koppers Co. for a battery of 82 Becker type coke ovens to be ready for operation July 1, 1930. With the completion of this battery, the company will have 437 ovens; the new battery will increase the annual production by 500,000 tons of coke. The company is selling coke to the Boston Consolidated Gas Co., for gas making purposes, and has been using high test gas to fire its ovens. With the completion of the new ovens high test gas instead of coke will be sold to the gas company.



"PITTSBURGH" BY SCHMITT

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Steel Treaters to Discuss Nitriding

A number of papers on the new process of hardening steel at low temperatures by ammonia (the so-called nitriding process) will feature the annual meeting of the American Society for Steel Treating, to be held in Cleveland, Sept. 9 to 13. Ad. Fry, the German inventor of the process, has signified his intention of being present. Papers so far secured for the symposium are:

"A Study of the Nitriding Process," by V. O. Homerberg and J. P. Walsted, Massachusetts Institute of Technology, Cambridge, Mass.

"A Few Fundamentals of the Nitriding Process," by H. W. McQuaid and W. J. Ketcham, Timken Detroit Axle Co., Detroit.

"Researches of Nitriding Steels," by Dr. O. E. Harder, J. T. Gow and L. A. Willey, University of Minnesota, Minneapolis.

"Short Time Nitriding of Steels in Molten Cyanides," by A. B. Kinzel and J. J. Egan, Union Carbide & Carbon Research Laboratories, Long Island City, N. Y.

"Observations upon the Iron-Nitrogen System," by Samuel Epstein, Illinois Steel Co., South Chicago, Ill.

"Investigations in Nitriding," by Robert Sergeson, Central Alloy Steel Corporation, Canton, Ohio.

"The White Layer in Gun Tubes," by H. H. Lester, Watertown Arsenal, Watertown, Mass.

Headquarters for the Steel Treaters will be at the Hotel Cleveland. Other organizations cooperating in the National Metal Congress are the Iron and Steel Division and the Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers (headquarters at Hotel Cleveland), the Iron and Steel Division of the American Society of Mechanical Engineers (headquarters at Hollenden Hotel), and the American Welding Society (headquarters at Statler Hotel).

Gear Manufacturers to Meet in Philadelphia

The fall meeting of the American Gear Manufacturers Association will be held at the Benjamin Franklin Hotel, Philadelphia, Oct. 24, 25 and 26, instead of at Briarcliff, N. Y., as first reported.

In addition to papers and addresses on technical developments and on subjects of general interest, recommended practices will be submitted by the association's technical standardization committees. T. W. Owen, 3608 Euclid Avenue, Cleveland, is secretary of the association.

Announce Aeronautic Meeting Papers

The joint meeting of the Society of Automotive Engineers and the Aeronautical Chamber of Commerce of America, to be held at the Hotel Hollenden, Cleveland, Aug. 26, 27 and 28, will feature papers on a variety of topics, including materials and welding. E. H. Dix, Jr., Aluminum Co. of America, Pittsburgh, will present a paper on the "Characteristics and Prevention of Corrosion of Strong Light Alloys," and H. S. Cooper, Beryllium Corporation of America, will speak on "Beryllium Alloys." A paper on "Welding Aircraft Parts" will be read by R. M. Mock, Bellanca Aircraft Corporation, Wilmington, Del.

Other topics include design of wings, gaging engine performance, high-temperature liquid-cooled engines, geared engines, load factors for aircraft structures, variable pitch propellers, load ratings of commercial airplanes and the selling of airplanes to business houses.

Produces Ball Bearings for Aircraft

Fafnir Bearing Co., New Britain, Conn., to meet the requirements of the aircraft industry, has produced a series of ball bearings of narrow width and dimensioned in inches and major fractions. This so-called "S Series" ranges from ¼ to 1 in. bore by seven steps, and has been designed by its recently organized aeronautical division to fill the needs for more rigid, frictionless and wear-resistant control mechanisms on aircraft.

Strategic Metals and Minerals

The United States Department of Commerce has issued Trade Promotion Series, No. 76, entitled "Mineral Raw Materials" (Price 45c.), a comprehensive survey of the production and consumption of metals and minerals.

This study is divided into two parts. In Part I each country is treated separately to indicate the magnitude of its requirements for each of the minerals and its ability to supply these from within its own borders, followed by a statistical analysis of production, imports, and exports covering the 5-year period 1923-1927.

In Part II each mineral is considered separately in its relation to the general world position of the various minerals and the relative positions occupied by each of the countries under review. Major sources of minerals are indicated.

Decrease in Imports of Pig Iron in June

WASHINGTON, July 26.—Imports of pig iron in June dropped to 11,396 gross tons from 14,393 tons in May. Last year the June total was only slightly heavier than in 1929.

For the six months, imports at 73,461 tons have been slightly less than the 75,295 tons of last year. There has not been much change in the line-up of countries of origin, although a heavy decline in incoming shipments from Great Britain, coupled with a moderate rise in those from India, brought the two close together at the end of June.

UNITED STATES IMPORTS OF PIG IRON BY COUNTRIES OF SHIPMENT

(In Gross Tons)

	June		Six Months Ended June	
	1929	1928	1929	1928
United Kingdom	3,040	6,726	26,872	34,727
British India	3,903	3,792	25,439	23,780
Germany	.....	55	103	95
Netherlands	3,600	894	17,474	13,515
Canada	49	.....	471	378
France	101	.....	101	.....
Belgium	.....	.....	184	202
Norway	464	50	1,340	91
Sweden	200	238	1,003	1,041
All others	39	44	474	1,466
Total	11,396	11,799	73,461	75,295

Completing Development of Haystellite Cutting Tools

It is expected that new tungsten carbide cutting tools bearing the name of Haystellite will be placed on the market before the end of the year by the Haynes Stellite Co., Kokomo, Ind.

The material is a modification of the alloy introduced by the company a short time ago for use as a diamond substitute on oil well bits and for drawing dies. It is not to be confused with Stellite, being radically different in composition, and is to be distinguished from most of the tungsten-carbide tools at present on the market in that it is a cast rather than a sintered alloy. Uniformity of product is a feature claimed.

Tests have been under way for several months in large production shops, and the alloy, so far as cutting tools are concerned, is in the final development stage. The company expects to be able to furnish sample tools in the near future.

Farrell-Cheek Expansion

The Farrell-Cheek Steel Foundry Co., Sandusky, Ohio, has found it necessary to make further additions to its foundry building. Construction is now in progress of a new addition that will be 60 x 100 ft. and will be used to house special steel operations. The building, it is expected, will be ready for occupancy by Sept. 1.

The building runs east and west and is part of the present structure. The core room of the foundry is now three times its former size and the addition now being built was necessary despite the fact that the capacity was doubled only last November.

Plans for other additions are under consideration and may be settled in the near future.

Continuous Type Rotary Machine Has Wide Range

IN drilling, tapping, threading, hollow milling, countersinking, facing and other operations, the eight-spindle continuous rotary machine illustrated is claimed to give high production, with savings in labor and floor space.

When only one operation is performed on the machine, eight pieces are finished at each complete revolution of the carrier, which rotates continuously about the column. A battery of the machines may be synchronized for successive operations, or a single machine may be tooled for drilling, reaming, facing, etc., the same piece. In the latter case the tools are mounted in sequence in the spindles, and the operator advances the piece one spindle each time it comes around to him until the piece is finished, putting a fresh piece under the spindle that performs the first operation. The machine is built by the Enterprise Mfg. Co., Third and Dauphin Streets, Philadelphia.

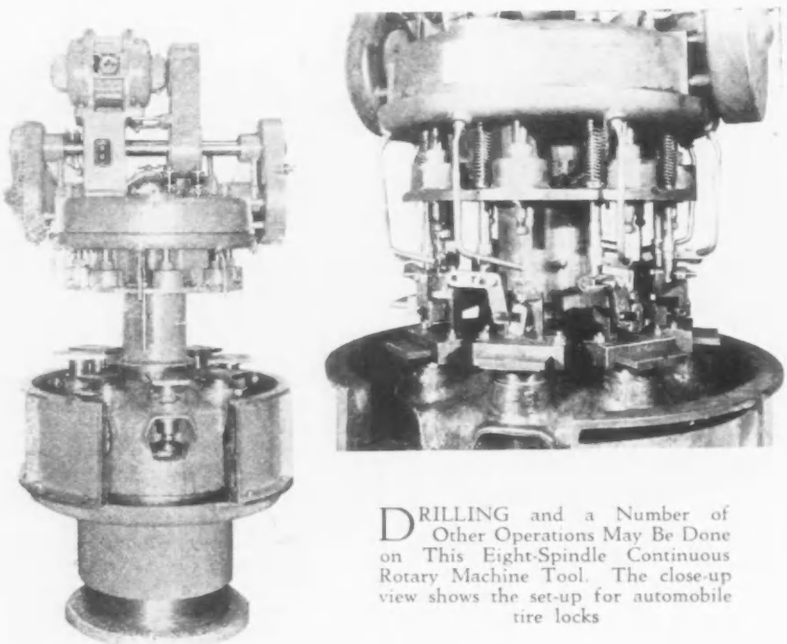
The rotating carrier mounts on its upper part the driving mechanism and the spindles, and on its lower part, the work-tables. There is a table for each spindle, and both move with their centers always in line. The work is fed to the tools, the spindles having no vertical motion. During each revolution of the carrier each table drops clear of the tool and is again raised and fed to the tool, the feed being obtained by a fixed ring cam and a roller at the bottom of each table plunger.

When the machine is on single operation work, the sole duty of the attendant is to unload and reload and clamp the work as it comes to the loading station. When automatic clamping jigs are used his task is reduced to merely moving the work in and out of the jig. Knock-outs, indexing jigs and other devices that can be actuated by a supplementary cam may be employed on the machine.

The machine is of simple design and has no small or delicate parts. It is equipped with motor drive, all-geared head and ball bearings. The spindle drive is through spur and bevel gearing at the right-hand end of the pulley or drive shaft, and variations in spindle speed are obtainable through change gears. The carrier is driven through change gears, planetary and bevel gearing at the left-hand end of the pulley shaft. The smallest member of the planetary gearing is 5 in. in diameter. The carrier drive, as well as each work-table, is protected by a shear key. All gears and other rotating parts are inclosed. Coolant is supplied only while the tools are cutting and chips are disposed of at every revolution of the table.

Individual adjustment is provided for each work-table by means of a right and left-stem that extends entirely through both parts of the table plunger. Simultaneous adjustment of all tables is made by rotating the large nut on the column by means of the crank and worm geared to it.

Equipped with the standard cam, the machine has capacity for drilling a ¾-in. hole in cast iron, a ⅝-in. hole in medium carbon steel to a depth of 1¼ in. Facing cuts up to 1/16 in. deep and 1½ in. in diameter may be taken in cast iron and up to 1/16 in. by 1¼ in. in steel. The total movement of the standard cam is 2 in. and of the special cam 3 in. The distance from the spindle to top of the table at highest point of the cam is 16¾ in. maximum and 10 in., minimum. The distance from center to center of spindles in a circle is 9 in. The maximum height of the table from the floor at the loading station is 42 in. The driving motor ranges from 5 to 15 hp. according to character of work. Floor space occupied by the machine is 4 x 4 ft., and the weight is approximately 5000 lb.

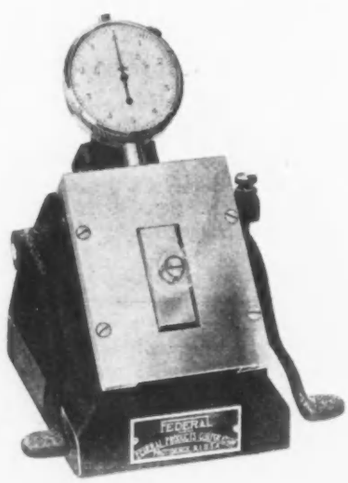


DRILLING and a Number of Other Operations May Be Done on This Eight-Spindle Continuous Rotary Machine Tool. The close-up view shows the set-up for automobile tire locks

Indicates 0.0001 In. Variations in Size of Small Holes

SIZE variations and amount of out-of-roundness of holes ranging from ⅜ to 1½ in. are determined rapidly by means of the gage illustrated, size variations down to 0.0001 in. being read directly from the dial and roundness checked merely by revolving the work. Long life is also a feature, it being claimed by the maker, the Federal Products Corporation, Providence, R. I., that the instrument has been known to measure more than 1,000,000 holes.

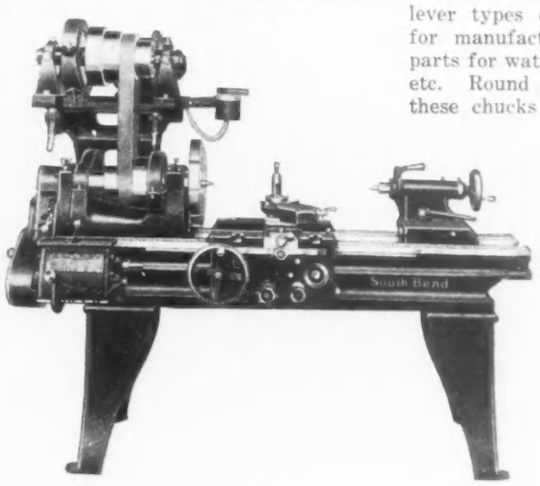
The indicating dial is 2¾ in. in diameter and is graduated in 0.001 and 0.0001 in., the 0.001 in. graduations being ¾ in. apart. The gage may be operated from either side and the parts gaged as rapidly as the operator can place them on the jaws. Setting the gage to measure different sizes of holes is accomplished conveniently by removing the top plate and loosening the screws that clamp the lower jaw in the dovetail, putting a master on the jaws or using a micrometer, as preferred, then setting the jaws so that the indicator registers about 0.001 in. on the minus side of zero. The jaws are then tightened and the gage is ready for use. The small knurled screw on the upper right-hand lever is a stop to adjust the range of the indicator.



Jaws are made in four different sizes: ⅜ to ½ in.; ½ to ¾ in.; ¾ to 1⅛ in.; and 1⅛ to 1½ in. One jaw is regularly furnished with the gage, which is designated as the model 36, other sizes being supplied as extras.

New Line of Motor-Driven Engine Lathes

A NEW model silent-chain motor-driven lathe is being built by the South Bend Lathe Works, South Bend, Ind., in sizes from 9 to 18 in., and in several different types, including bench, tool-room, manufacturing the gap bed, equipped with either standard or quick change gears.



BELT Shifting Is Facilitated by the Tilting Motor Table. The drum type control switch is within easy reach of the operator

The machine is self-contained and requires no more floor space than the countershaft driven lathe. It is equipped with a reversing motor mounted with the driving cone on a table above the machine. This table is supported by a bracket securely fastened to the lathe bed and is arranged so that it may be tilted forward by means of a convenient lever to relieve belt tension and facilitate belt shifting. Independent adjustment is provided for taking up belt slack. From the motor, the drive to the upper cone is by silent chain, which is provided with a felt wick oiler and is entirely inclosed by a guard of improved design. A special guard that covers the driving cone, the belting and the spindle can be furnished if desired. The size of motor varies from ¾ to 3-hp., according to the size of lathe.

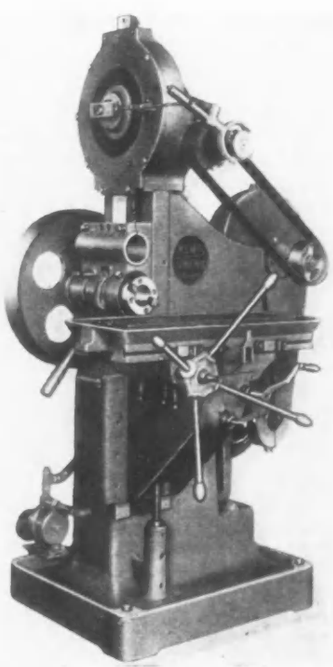
Drum-type reversing control switch is employed, it being considered the most practical for a motor-driven screw-cutting lathe because of the continual starting, stopping and reversing the lathe spindle. Wiring from the motor to the switch is inclosed in flexible metal conduit.

The bronze spindle bearings are lubricated from an oil cup with hinged lid, the oil flowing down around the upper half of the bearing to wicks located in small squares milled out of the lower half of the bearing at the point where it meets the upper half. This system is intended not only to assure adequate supply of oil, but to keep dust and dirt from the bearings. Felt shear wipers are provided for the V-ways of the bed. The machine is equipped with an automatic interlock to prevent simultaneous engagement of the automatic feeds and the half nuts for thread cutting. The tailstock has a set-over for taper turning and a binding lever that locks the spindle without disturbing the alinement. The spindle is graduated in 1/16 in.

Attachments include handwheel and lever types of draw-in collet chuck for manufacture of small precision parts for watches, typewriters, radios, etc. Round split collets for use in these chucks are made in a number of sizes, and square and hexagon types can be furnished. They are hardened and tempered and ground both inside and outside. A spindle nose collet chuck, for large collets, is also made.

Milling Machine With Cam Feed to Head

CAM feed to the head, permitting use of a feed or rate of travel to suit any change in cross section of the cut, thus assuring maximum output, is a feature of a new production milling machine put out by the Kent-Owens Machine Co., Toledo, Ohio. This feed may be operated continuously or disengaged automatically upon completion of the cycle. With continuous operation, the operator simply loads and unloads the work and if an indexing fixture can be used, production may be further increased, one side of the fixture being loaded while the work in the other side is being milled.



Cam-Actuated Head Permits Use of Feeds to Suit Changes in Cross-section of Cut

The machine may be arranged for either countershaft or motor drive. From the motor, which is mounted on the back of the column, the drive is by silent chain to the backshaft, from which the power is transmitted by belts to the vertical feeding mechanism and the spindles. Both the backshaft and the spindle are mounted on Timken roller bearings, and a heavy flywheel is provided on the spindle to prevent chatter and vibration. The spindle is of standardized type. The cam drive is through a hardened steel worm and bronze worm wheel, wear between which is taken up by means of an eccentric bushing. Both the cam and follower are of hardened steel. Cams to suit particular requirements can be furnished.

Conditions In Germany May Widen Machine Tool Market

Changed conditions in Germany that improve the outlook for sales of American machine tools in that and other European countries are pointed out by E. F. Du Brul, general manager of the National Machine Tool Builders Association, in a recent bulletin to member companies.

It seems probable, the bulletin states, that the reparations settlement will do much toward clarifying conditions in Europe and will encourage industrialists to proceed at a more rapid rate than in the immediate past.

"Until recently the German situation, in particular, has been quite discouraging. As recently as the first of March there were in Germany 2,460,000 receiving unemployment dole, but by April 30 this had been reduced to 1,100,000, or to more than one half in less than two months. Part of the unemployment of course was largely influenced by the building trades and other industries which depended on weather conditions. Nevertheless, the change has been quite remarkable.

"It also seems probable that reparations in kind will have a tendency to decrease, and that this will tend to relieve the United States from this type of competition in France."

The Edward G. Budd Mfg. Co., Philadelphia, reports a production of 1,233,323 steel automobile doors for the first six months of 1929. This compares with the production of 1,317,507 doors during the entire year 1928.

Where Steel Exports Went in First Half-Year

Canada Took 393,731 Tons of Nine Leading Items—Japan Retains Second Position with 81,004 Tons, Followed by Argentina, 30,807 Tons; Philippines, 25,019 Tons; Mexico, 20,382 Tons

Exports from United States, by Countries of Destination

(In Gross Tons)

	Steel Plates				Galvanized Sheets				Black Steel Sheets			
	June		Six Months Ended June		June		Six Months Ended June		June		Six Months Ended June	
	1929	1928	1929	1928	1929	1928	1929	1928	1929	1928	1929	1928
Total	*17,646*	*14,529*	*107,296*	*71,726*	*12,604*	*10,490*	*86,420*	*75,125*	*15,718*	*19,223*	*92,763*	*90,311*
Canada	14,791	12,202	90,516	60,584	3,534	3,185	18,900	17,132	9,231	9,767	52,879	40,500
Japan	271	386	1,692	878	312	110	1,365	1,096	3,067	7,207	13,107	37,430
Cuba	104	64	829	356	617	549	2,907	2,721	78	272	761	1,101
Philippine Islands	77	368	882	1,748	1,182	168	13,865	11,446	5	306	2,419	1,399
Mexico	54	132	343	373	1,355	730	6,719	4,085	331	275	1,815	1,169
Argentina	....	....	....	....	785	1,000	3,435	4,149	629	195	3,208	923
Chile	....	....	....	....	....	....	....	....	....	45	1,447	151
Colombia	....	....	....	....	19	768	3,238	3,607	26	25	148	281

	Steel Rails				Barbed Wire				Plain and Galvanized Wire			
	June		Six Months Ended June		June		Six Months Ended June		June		Six Months Ended June	
	1929	1928	1929	1928	1929	1928	1929	1928	1929	1928	1929	1928
Total	*7,389*	*10,499*	*85,566*	*109,124*	*6,395*	*7,000*	*35,688*	*38,426*	*3,789*	*4,657*	*26,137*	*23,673*
Canada	1,681	2,061	13,981	10,557	528	757	1,532	2,493	732	1,277	8,292	7,969
Japan	....	3,585	5,470	9,718	....	....	....	....	139	421	882	651
Cuba	150	180	5,429	1,461	620	661	1,443	2,555	143	415	605	614
Philippine Islands	151	30	4,206	3,925	486	184	3,296	799	74	95	351	145
Mexico	119	673	1,643	3,284	618	493	3,192	3,541	209	283	1,078	1,151
Argentina	489	883	1,755	2,776	620	1,981	3,955	8,869	909	1,633	4,844	4,699
Chile	265	....	12,196	20,514	....	....	....	....	....	....	....	....
Colombia	223	2,092	3,106	9,200	209	556	4,564	2,079	....	....	....	....
Brazil	795	12	4,440	13,581	1,267	546	....	8,656	280	135	909	535
China	372	....	4,151	21,028	....	....	....	....	....	....	....	....

	Tin Plate				Steel Bars				Heavy Plain Structural Material			
	June		Six Months Ended June		June		Six Months Ended June		June		Six Months Ended June	
	1929	1928	1929	1928	1929	1928	1929	1928	1929	1928	1929	1928
Total	*18,041*	*22,276*	*136,121*	*125,099*	*12,249*	*13,816*	*112,620*	*70,768*	*31,268*	*19,356*	*145,866*	*89,873*
Canada	3,892	5,558	23,765	23,387	7,460	9,139	58,553	46,547	26,966	17,377	125,313	75,492
Japan	4,345	3,195	34,960	26,683	281	166	18,602	480	2,359	5	4,926	1,184
Cuba	303	327	3,207	2,384	234	229	2,053	2,525	387	421	1,479	2,299
Mexico	668	1,179	4,583	6,786	194	56	710	374	50	130	299	603
Argentina	2,003	2,456	11,749	10,255	....	....	....	....	....	17	1,861	195
Chile	561	308	2,885	1,740	....	....	....	....	522	236	2,905	1,895
Brazil	224	90	9,963	1,721	....	....	....	....	....	....	....	....
China	2,211	2,945	11,446	9,151	....	....	....	....	....	....	....	....
British India	123	17	3,714	3,491	....	....	....	....	....	....	....	....
United Kingdom	....	....	844	169	2,058	1,336	10,386	7,934	....	....	....	....
Italy	584	651	3,884	6,694	....	....	....	....	....	....	....	....

Destination of Iron and Steel Exports from the United States

(In Gross Tons)

Country of Destination	June, 1929	January Through June	
		1929	1928
North and Central America and West Indies	*139,449*	*814,751*	*651,279*
Canada and Newfoundland	117,056	675,614	535,834
Cuba	4,624	36,352	31,246
Guatemala	335	3,827	5,835
Honduras	736	6,727	3,951
Mexico	10,876	46,085	39,797
Panama	1,040	10,221	8,508
Salvador	234	4,213	1,911
British West Indies	1,662	12,385	4,367
Other West Indies	2,127	14,384	15,035
Other Central America	759	4,943	4,795
South America	*27,026*	*215,321*	*217,350*
Argentina	8,420	53,787	51,202
Brazil	4,681	33,516	41,308
Chile	2,879	31,841	36,125
Colombia	2,723	24,739	35,206
Peru	2,365	17,672	13,390
Uruguay	374	5,441	5,084
Venezuela	5,189	45,313	31,900
Other South America	395	3,021	3,135
Europe	*31,599*	*192,652*	*149,673*
Belgium	165	1,800	7,297
France	1,564	9,854	2,499
Germany	766	12,724	20,415
Italy	10,495	64,432	44,101
Netherlands	168	1,514	1,333
Poland and Danzig	7,406	47,762	32,040
Rumania	182	1,805	2,396
Soviet Russia	159	2,112	1,569
United Kingdom	5,455	31,311	26,454
Other Europe	5,239	19,338	11,569
Far East	*46,982*	*357,518*	*331,157*
British Malaya	85	4,408	3,414
China	4,587	41,351	57,535
Netherlands East Indies	3,269	36,821	14,051
India and Ceylon	1,440	11,246	13,562
Japan	27,558	186,742	181,572
Kwantung	609	7,871	2,981
Philippine Islands	5,078	47,051	44,133
Australia	2,593	11,447	7,585
New Zealand	226	2,795	1,047
Other Asia and Far East	1,537	7,786	5,277
Africa	*2,755*	*11,597*	*7,903*
Union of South Africa	1,029	4,193	3,480
Egypt	1,100	5,195	3,088
Mozambique	288	1,104	479
Other Africa	338	1,114	856
Total	247,811	1,591,839	1,357,362

Strong Steel Earnings Statements

Quarterly Reports of United States and Bethlehem Steel Corporations and Others

TOTAL earnings of the United States Steel Corporation for the three months ended June 30 amounted to nearly $72,000,000. This compares with $60,105,381 for the first quarter and with $46,932,986 for the corresponding quarter last year. The earnings of the second quarter of 1917, a war year, were $90,579,204.

Income available for common stock dividends and surplus amounted to $47,520,924. The regular common stock dividend of 1¾ per cent was declared on 8,030,304 shares, being 7,116,235 shares previously outstanding plus 914,069 fully paid for under the subscription offer of April 16. Thus there are 102,536 shares under the subscription offer that have not yet been taken or fully paid for. On the basis of the 8,030,304 shares, the net income in this last quarter was at the rate of $5.92 per share, but on the basis of the earlier number of 7,116,235 shares, the income was $6.68 per share and compares with $5.04 for the first quarter.

Total earnings of the first half of this year were $132,100,842 and those for the first half of 1928 were $87,867,018. The accompanying table gives the principal figures.

May Acquire Columbia Steel Corporation

No official statements have been made with regard to reports that the United States Steel Corporation is negotiating to secure the property of the Columbia Steel Corporation. What it would acquire includes a modern blast furnace near Provo, Utah, with a by-product coke oven plant of 850 tons daily capacity; rolling mills at Pittsburg, Cal., and at Torrance, Los Angeles, making steel bars, sheets, wire and nails; steel casting plants at Pittsburg and Portland, Ore., and raw material properties.

The steel foundry at Pittsburg was described in THE IRON AGE of Jan. 23, 1919, and the rolling mill at Pittsburg, the open-hearth furnaces and 18-in. and 12-in. bar mills, were illustrated in the issue of June 24, 1920. The Torrance plant was originally owned by the Llewellyn Iron Works but has been enlarged in both the steel making and rolling departments. Columbia's entering in the sheet business was the result of the purchase of the plant of the Pacific Sheet Steel Co. in South San Francisco.

Earnings of Steel Corporation

Earnings for Second Quarter

		Total Earnings
April, 1929		$22,361,428
May, 1929		25,604,641
June, 1929		24,029,392
Total earnings after deducting expenses, taxes and interest		$71,995,461
Less charges and allowances for depletion, depreciation and obsolescence		15,919,386
Net income		$56,076,075
Deduct: Interest corporation bonds		2,250,232
Balance		$53,825,843
Dividends: Preferred, 1¾ per cent	$6,304,919	
Common, 1¾ per cent	14,053,032	
		20,357,951
Surplus for the quarter		$33,467,892

Bethlehem Earns $5.33 a Share

THE Bethlehem Steel Corporation reported net income for the second quarter of $11,766,473 after interest, depreciation and depletion charges, which was equal, following the deduction of 7 per cent cumulative preferred dividends, to $5.33 a share on the common stock outstanding. This compares with $9,045,590 in the preceding quarter, or $4.05 a share on a smaller number of shares, an additional 600,000 having been issued as of June 19, 1929. Net income in the second quarter of 1928 was $4,529,328, or $1.57 a share on the common stock then outstanding.

The directors declared a dividend of $1.50 a share on the common stock, placing the common shares on a $6 per year basis, compared with $4 previously. They also declared the regular quarterly dividend on the preferred stock.

In commenting on the report, E. G. Grace, president, stated that billed prices showed an encouraging gain over those of the preceding quarter, as well as the corresponding quarter, last year. Current operations are at approximately 99 per cent of capacity and will remain at about that rate through August. In September, fall demands should make themselves felt, and business throughout the rest of the year, judging from present indications, should be in sustained volume, he declared. Recessions in the consumption of steel in some lines, notably the automobile industry, have been offset in large part by increased requirements in other directions. The outlook in structural steel, he said, is unusually promising, and he expects railroad buying to keep up at a good rate. Exports are the largest the company has made since the war, and the reparations settlement is favorable to a continued high volume of foreign trade.

The company has no outstanding improvement program to announce at this time, Mr. Grace said, but the issuance of 600,000 additional common shares in June was for the purpose of furthering general improvements, which are being made continually. Although it was not many months ago that surplus capacity in steel was regarded as one of the main problems confronting the industry, there is no doubt, he stated, that the country would have suffered great harm in recent months if capacity had not measured up to demand.

The Bethlehem corporation's operations during the second quarter averaged 100.6 per cent of rated capacity, compared with 91.9 per cent in the first quarter and 82.5 per cent during the second quarter of 1928.

The value of orders on hand June 30 was $56,829,800, compared with $62,702,683 at the end of the previous quarter and $51,761,908 on June 30, 1928.

Earnings of Other Steel Companies

The Sharon Steel Hoop Co. reports earnings from operations in the first six months of 1929 of $1,761,208.23, after full charges for maintenance and repairs to plants. After deducting depreciation charges of $507,791.58, bond interest of $177,864.54 and government profits tax of $131,001.77, net earnings amounted to $944,550.34, as against $971,853.53 for the entire year 1928. This is equal to $2.63 a share on 359,240 shares of stock. During the past six months the company put into operation its new continuous hot-strip mill and cold-rolled strip mill. It is stated that the new departments should add materially to the company's future earnings.

Net income of the Eastern Rolling Mill Corporation in the second quarter was $252,373, after all charges, compared with $203,396 in the corresponding period of 1928.

The Follansbee Brothers Co. earned a net profit of $999,660 in the six months ended June 30. This is after depreciation, interest and federal taxes, equivalent after preferred dividends to $5.05 a share on 180,000 shares of common stock. For the first quarter of 1929 the company reported a net profit of $402,572, equivalent to $1.98 a share.

In the first six months of the year the Sloss-Sheffield Steel & Iron Co. had a net income of $655,878, after depreciation and depletion, but before interest and federal taxes.

Net profits of the Truscon Steel Co. in the second quarter totaled $1,-

Comparison of Quarterly Earnings of Bethlehem Corporation

	Second Quarter, 1929	First Quarter, 1929	Second Quarter, 1928
Total income of corporation and subsidiaries	$18,069,082	$15,245,471	$10,767,959
Less interest charges	2,773,642	2,780,575	2,841,636
Balance	$15,295,440	$12,464,896	$7,926,323
Less provision for depletion, depreciation and obsolescence	3,528,967	3,419,306	3,396,995
Net income for period	$11,766,473	$9,045,590	$4,529,328
Less dividends:			
Pref. stock	$1,750,000	$1,750,000	$1,697,500
Com. stock	3,600,000	2,400,000	.....
Total	$5,350,000	$4,150,000*	$1,697,500
Surplus for period	$6,416,473	$4,895,590*	$2,831,828

*Adjusted to reflect dividend payable Aug. 15, 1929, on additional 600,000 shares issued June 18, 1929.

003,494, after depreciation, federal taxes and other charges equivalent to $1.59 a share on 589,036 shares of $10 par value common stock. This compares with $785,143, or $1.22 a share, in the same period of 1928.

Campbell, Wyant & Cannon Co. and its subsidiary, National Motor Castings Co., report net profit in the first quarter of 1929 of $531,379, equal to $1.53 a share on 348,000 shares of stock.

Fabricated Structural Steel

About 60 Per Cent of Awards Were in Canada and Northeastern Part of United States

STRUCTURAL steel awards of 34,000 tons in the past week were about equally divided between railroad and industrial work and non-industrial projects. About 60 per cent of the lettings were in Canada and the northeastern section of the United States. Fresh inquiries, totaling 36,000 tons, were slightly larger than those of the previous week.

Among the larger contracts placed were 6000 tons for an office building at Montreal, Que., 3800 tons for an office building at Newark, N. J., 3000 tons for a Chevrolet assembly plant at Tarrytown, N. Y., and 2200 tons for an aircraft manufacturing plant at East Hartford, Conn. New work on which bids are being asked include 8000 tons for approaches to the McKinley bridge at St. Louis, 6000 tons for a State agricultural building at Harrisburg, Pa., and 2200 tons each for a Chicago school and for a mill building for a copper company in Arizona. Awards follow:

BOSTON & ALBANY RAILROAD, 650 tons, roundhouse in Brighton district, Boston, to unnamed fabricator.

BOSTON & MAINE RAILROAD, 250 tons, roundhouse at Somerville, Mass., to Boston Bridge Works, Inc.

BOSTON & MAINE RAILROAD, 350 tons, three bridges at Lansingburg, N. Y., to Boston Bridge Works, Inc.

MONTREAL, QUE., 6000 tons, office building, to Dominion Bridge Co.

JAMAICA, VT., 125 tons, highway bridge, to American Bridge Co.

HYDE PARK, MASS., 120 tons, garage and stock building for Edison Electric Illuminating Co., to McClintic-Marshall Co.

EAST HARTFORD, CONN., 2200 tons, Pratt & Whitney Aircraft Corporation plant, to Levering & Garrigues Co.

MONTICELLO, N. Y., 130 tons, telephone building, to unnamed bidder.

DOBBS FERRY, N. Y., 200 tons, telephone building, to Elby Structural Steel Co.

TARRYTOWN, N. Y., 3000 tons, assembly plant for Chevrolet Motor Co., to Mahon Structural Steel Co.

VESTA, N. Y., 175 tons, two highway bridges, to American Bridge Co.

NEWARK, N. J., 3800 tons, American Insurance Co. building, to Hedden Iron Construction Co.

RIVERTON, N. J., 150 tons, Delaware River bridge between Riverton and Belvidere, to Bethlehem Fabricators, Inc.

TRENTON, N. J., 1050 tons, Trenton Senior High School, to American Bridge Co.

FLORENCE, N. J., 200 tons, machine shop, to Belmont Iron Works.

MINERSVILLE, PA., 500 tons, factory for H. D. Bob & Co., reported to Bethlehem Construction Co.

NETTONA, PA., 120 tons, tank foundations, to Pittsburgh Bridge & Iron Co.

SEABOARD AIR LINE, 250 tons, bridge at Hopewell, Va., to Virginia Bridge & Iron Co.

DETROIT, 2800 tons, municipal airport, to Whitehead & Kales Co.

DETROIT, 800 tons, warehouse for Michigan Telephone Co., to Russell Steel Construction Co.

DETROIT, 1200 tons, plant addition for Detroit Steel Products Co., to Russell Steel Construction Co.

DETROIT, 100 tons, store, to Palmer Bee Co.

GRAND RAPIDS, MICH., 100 tons, Michigan Telephone Co., warehouse, to R. C. Mahon Co., Detroit.

MUSKEGON, MICH., 600 tons, building, to Massillon Bridge & Structural Co.

MICHIGAN CENTRAL RAILROAD, 800 tons, grade separation work in Detroit and vicinity, to McClintic-Marshall Co.

CLEVELAND, 130 tons, Lincoln Electric Co., all-welded warehouse, to Austin Co.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS RAILROAD, 2000 tons, two bridges in Indiana, to American Bridge Co.

NEWBURG, WIS., 110 tons, State highway bridge, to Wisconsin Bridge & Iron Co.

CHICAGO, 700 tons, Henrici restaurant, to unnamed bidder.

CHICAGO, 250 tons, Continental Can Co. building, to Mid City Iron Works.

ST. LOUIS, 350 tons, service building for Mack Truck Co., to Mississippi Valley Structural Steel Co.

ST. LOUIS, 150 tons, Procter & Gamble Co. building, to St. Louis Structural Steel Co.

COLUMBIA, MO., 375 tons, field house for University of Missouri, to Stupp Brothers Bridge & Iron Co.

POMONA, CAL., 100 tons, telephone building, to McClintic-Marshall Co.

HUNTINGTON PARK, CAL., 200 tons, factory for Axelson Machine Co., to Consolidated Steel Corporation.

SAN FRANCISCO, 500 tons, hotel, Post Street, to McClintic-Marshall Co.

OAKLAND, 100 tons, plates 54-in. riveted steel pipe for East Bay Municipal Utility District, to unnamed fabricator.

PORTLAND, ORE., 900 tons, office building, Tenth and Washington Streets, to Poole & McGonigle.

SEATTLE, 150 tons plates, digester for Rainier Paper & Pulp Co., to Willamette Iron & Steel Co.

LOS ANGELES, 100 tons, warehouse, 3275 East Slauson Avenue, to an unnamed bidder.

NEWPORT BEACH, CAL., 150 tons, bridge on Lido Island, to an unnamed bidder.

OLYMPIA, WASH., 100 tons, bridge over Soldue River, to an unnamed fabricator.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

BOSTON, 1050 tons, Congress Street bridge.

BOSTON, 300 tons, fire department building in Bowdoin Square.

PROVIDENCE, R. I., 100 tons, Roger Williams Avenue bridge.

STAMFORD, CONN., 650 tons, First National Bank building.

BRISTOL, CONN., 200 tons, building for New Departure Mfg. Co.

NEW YORK, 2550 tons, pier 3, North River; Lane & Ogle, Inc., low bidder on general contract.

ELIZABETH, N. J., 600 tons, New York & New Jersey Telephone Co. building.

ALBANY, N. Y., 500 tons, printing building for J. B. Lyon Co.

PENNSYLVANIA RAILROAD, 14,000 tons, bridge over Hackensack River; Phoenix Bridge Co., low bidder.

PHILADELPHIA, 2000 tons, plant addition for Atwater Kent Co.

PHILADELPHIA, 5000 tons, convention hall and auditorium; call for bids about Aug. 15.

HARRISBURG, PA., 6000 tons, Agricultural Building.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC, 800 tons, track elevation at Evanston, Ill.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC, 650 tons, subway at Milwaukee.

CHICAGO, 2200 tons, public school.

CHICAGO, 400 tons, building for Crane Co.; Graham, Anderson, Probst & White, architects.

PRINCETON, WIS., 250 tons, State highway bridge; C. R. Meyer & Sons Co., Oshkosh, Wis., general contractor, steel to be sublet.

MILWAUKEE, 500 tons, emergency hospital.

ST. LOUIS, 8000 tons, approaches to McKinley bridge.

STATE OF ARIZONA, 2200 tons, mill buildings for a copper company.

SEATTLE, 3700 tons, plates, Cedar River pipe line; Western Pipe & Steel Co., low bidder.

PORTLAND, ORE., 105 tons, bridge over Nehalem River; bids opened.

LOS ANGELES, 1500 tons, Los Angeles Stock Exchange Building; bids about Sept. 1.

Automobile Outlook Bright

PHILADELPHIA, July 30.—It is generally believed that production for July in automobiles will prove greater than in July, 1928. Production during August is expected to exceed that of July, according to *Automotive Industries*, because of increased production schedules contemplated by several companies that are preparing to introduce new models.

Improvement in the agricultural outlook throughout the country, it is considered, will be a highly favorable influence on the automobile market during the next several months. It appears doubtful that output for any of the remaining months of this year will fall below that for the corresponding months of last year.

The Pennsylvania Railroad recently placed an order for 1000 all-metal box cars to be manufactured of pure iron sheets. The Armco ingot iron sheets for these cars will be rolled on the new continuous mills of the American Rolling Mill Co.

This Issue in Brief

Savings of more than one-half million dollars per year are expected to result from two-weeks war against waste. Over 3500 suggestions were received in automobile company's anti-waste campaign, conducted at a cost of $16,000.—Page 263.

* * *

Cuts labor expense 15 per cent and doubles plant output by installing conveyors for assembly operations. New material-handling system in Studebaker plant contains many unusal innovations.—Page 269.

* * *

Electric welding of merchant ships expected to save 8 to 10 per cent deadweight. Welding is being used increasingly in German yards for ship fabrication.—Page 323.

* * *

Erects small metal buildings without rivets, bolts, or welding. Pliers, wrench and screw-driver are all the tools to erect buildings with new locking device.—Page 281.

* * *

Alloy iron castings find their greatest use in automobile industry. Mayari pig iron is used to a considerable extent, principally for cylinder blocks and cylinder heads.—Page 282.

* * *

Conserves heat, reduces labor cost, and eliminates splashing by using new spherical hot-metal ladle. Keeps the metal hot longer than the old, straight-side ladle. Skull is practically eliminated.—Page 284.

* * *

Gain of 27 per cent in American machinery exports in first half of 1929 over same period of last year. Shipments were valued at more than 300 million dollars. June total was close to 50 millions, a gain over both May, 1929, and June, 1928.—Page 326.

Bearing bronzes should have not less than 4 per cent tin, and need not have more than 15 per cent lead. Bureau of Standards finds little advantage in greater lead content. Addition of 4 per cent zinc had a good influence on the properties of the bronze.—Page 265.

* * *

Reduce waste of storing obsolete patterns by making a periodic survey. Rule of thumb method of destroying patterns unused for a definite period may prove expensive. A better way is to have them looked over at intervals by an individual or committee acquainted with probable requirements.—Page 275.

* * *

Perfects chrome-plating process for aluminum. Can be applied to stampings, sheets and castings, enabling them to resist acids which affect aluminum. Will increase the durability of aluminum parts in service subject to wear. May also solve the problem of atmospheric corrosion in aircraft parts.—Page 325.

* * *

Avoids conveyor tie-ups when machine tools are under repair by *not* routing conveyors under machine tools. Instead, cylinder blocks are lifted from conveyors to machine tools by rope hoists.—Page 269.

* * *

Floor space saved by upending auto bodies awaiting movement to main assembly lines. A specially designed mechanical device "noses" bodies, reducing considerably the amount of storage space needed.—Page 272.

* * *

"Mike" carries instructions from operators on rolling mill floor to loud speaker in operating pulpit. Motors for new hot strip mill are controlled completely from pulpit.—Page 268.

Finished steel exports up 20 per cent for half year, imports down 28 per cent, compared with same period of 1928. More than one million tons of rolled and finished steel shipped out of United States during first six months.—Page 324.

* * *

Iron and steel scrap complaints should be registered with newly organized Trade Relations Bureau of Scrap Institute. Federal Trade Commission approves scrap code.—Page 286.

* * *

Charge for pattern storage should be made by jobbing foundries after patterns have been stored for a certain time. It is good practice to notify the customer at expiration of the free storage period.—Page 276.

* * *

Narrow conveyors obviate need for rotating stands for use in assembling motors. Chain conveyor is equipped with steel plate carriers which convey motors at a 30-deg. angle. Conveyor framework is so narrow that operators can get at motors easily.—Page 272.

* * *

Twenty-five per cent longer service claimed for ingot molds made of new low-sulphur iron. Cracking of ordinary cast iron molds is said to be due to differing coefficients of expansion of the steel matrix and the graphite in the cast iron.—Page 280.

* * *

Impractical to substitute welded-steel construction wherever cast metal is used, says machinery builder. Welded steel construction is ideal for special machines, only one or two of which are built per year, or for building the first standard machine of a new design.—Page 278.

A. I. FINDLEY
Editor

THE IRON AGE

W. W. MACON
Managing Editor

ESTABLISHED 1855

Mechanization Aids Summer Work

STEEL has not had its usual summer dip in production, and an explanation is sought. In the common reckoning two general seasons of activity in buying and in production have been recognized—one a preparation for summer, the other a preparation for winter; whereupon summer would fall between these two periods. Another factor to which some observers have given attention is buying habits; executives desiring to take summer vacations and arranging their affairs in advance. That would explain seasonal periods in buying better than seasonal periods in delivery, for the executive could arrange simply a schedule of deliveries to be made during his absence.

A further thought on this subject is that in the past it was difficult to get workmen to perform well in summer, the work being arduous. Now, with increased mechanization all along the line, work is not so arduous, it being more a matter of controlling machinery. Notably that is the case at blast furnaces and in steel mills, where there are fewer men per unit of output, the men do not have as much physical exertion, and there are various appliances to make things more comfortable. In sheet and tin mill work in particular a veritable revolution has been wrought, working conditions for the hot mill crews being vastly improved.

On June 1 of this year steel mills had a large volume of shipping orders on books, and on July 1 the volume was simply diminished, still making a substantial total. It does not follow that consumption of steel was materially delayed; that if there had been much heavier deliveries in May the actual consumption would have been correspondingly greater; and the same may be said of June.

So far as the passage of time has thus far permitted, the sustained activity in steel production in the summer has quite fallen in with Mr. Farrell's wish expressed at the May meeting of the American Iron and Steel Institute: "Let us spread out this business. Do no let us try to do all the business that we can possibly do in three or four months of the year and have nothing left."

Improvement in equipment, appurtenances and methods has made work in summer easier and thus stimulates it. Here is one reason among several why we have more activity at the mills this summer than in the old-time summer. Along much the same line we see improvement in operation in winter. The railroads are the most notable example, functioning well in spite of the natural impediments of winter. It used to be considered necessary, for instance, for consumers to lay in large stocks of coal for winter. Nowadays they are quite indisposed to stock up to any extent. We have been getting down to steadier work all around.

We are quite aware that what is said above of the greater ease with which high production can now be attained in the summer season does not cover the larger question of the relation between current steel consumption and production. Leaders in the industry, who only two months ago, at the meeting of the American Iron and Steel Institute, were cautioning that "new building be kept within reasonable control" have since been led to ask whether the increasing uses of their products have not been stealing up on our capacity more rapidly than our forecasting formulas have led us to think. The answer to that question may show that the influences immediately shaping the course of the industry are not seasonal but stronger and more permanent.

Pots and Pans

RECENTLY a group of technical editors was privileged to inspect an extensive display of aluminum cooking utensils. Whatever the extent of his limitations as an art critic, one of those present could not escape the impression that the specimens exhibited a wide range in esthetic value. Among them were stew pans, egg cups and double boilers exactly like the ones sold nearly 20 years ago, by door-to-door canvassers, college boys at once earning money for schooling and providing an outlet for the new metal products. These pans conformed to shapes which were arrived at with the least effort and the simplest tools. Economy of production and simple utility were unquestionably the prime considerations in the mind of the manufacturer. Beauty—well, whoever thought of art in pots and pans in 1910?

More recently we have rediscovered the fact that simply because a thing is to be used every day it need not hence be ugly. Rediscovered, because artisans in bygone days successfully blended beauty with utility, even in metal in Damascened sword blades, forged wrought iron grills, hammered vessels, or embossed silverware. The combination of comeliness and grace is possible even in an aluminum stew kettle, for one notable specimen in the exhibit had eye-satisfying proportions of height to diameter; the handle was shapely and set at exactly the right angle; the sides bulged just enough for the height, and the thickness of the plate and roll on

the lip were correct for the other dimensions. A hundred years from now our great-great-grandchildren will give this stew kettle a place of honor in their home, alongside the silver teapot made by Paul Revere; not because the two pieces are antiques, but because they are specimens of metal work in which utility, form and mass have been harmoniously blended by artists who knew the capabilities of the metal they worked and the limitations of their manufacturing methods.

Mending a War Rent

DURING the week of Sept. 9 when our own Institute of Metals will be meeting with sundry steel men in Cleveland, the British Institute of Metals will journey to Düsseldorf and hold joint discussions with the Verein Deutscher Ingenieure and the Deutsche Gesellschaft für Metallkunde. The announcement tells us that the latter gathering is notable because it is the first formal meeting of British engineers with their German associates since 1914. Thus it is apparent, in form at least, that the directors of the British and German societies believe that the war is over.

Whether eleven years is sufficient to heal the deep wounds of the great cataclysm is doubtful; but intellectual intercourse must be resumed sooner or later. Many will absent themselves from the meetings, not a few who do attend will be nervous and somewhat constrained in behavior. Utter frankness, of course, will be impossible. The program recognizes this when it "requests business competitors not to apply for tickets to the various plant visitations." Such plainness of speech is to be preferred to the custom, more honored in the observance than the breach, at some American plants, of detaining the visitor with inconsequential matters until 11:30, then reaching the interesting operations just as the whistle blows for the lunch hour.

The New Natural Gas Boom

SQUARE the diameter in inches of a natural gas pipe line and multiply by 3000. The product is approximately the number of tons of coal per annum represented on a heat unit basis. A 20-inch pipe line represents about 1,200,000 net tons of coal per annum, one-fifth of 1 per cent of our total coal production of late. The lines will not all operate at capacity, but on the other hand the gas will be burned more efficiently than coal, so the comparison is a fair one to furnish a conception of what these pipe lines mean. The steel trade has been much interested in line pipe orders. Thus far the record in size is the 950-mile line from Texas to Chicago, involving 191,000 net tons; but still larger lines are being planned.

The reason natural gas discoveries in the last few years have been bringing such interesting news, and orders, to the steel trade is that the gas was discovered out West, where the distances are great and much of the gas must go several hundred miles to find enough people to consume it. At the same time the financing of these projects has become relatively easy.

The particular activity in this laying of natural gas lines covers thus far a period of less than two years. Lacking an exact count, we estimate that the lines completed in this period and those now being laid will transport about one-third as much natural gas as was produced in 1927. The production of that year was about 1,370,000,000, in thousands of cubic feet. The estimate of increase is only a rough one, but it gives an idea of the importance of the work. Additional projects come up at intervals, but in some quarters it is doubted that there will be enough gas to take care of them all.

In 1927 the three fuels produced, coal, petroleum and gas, represented about 22,624 trillion B.t.u., computed by standards adopted some time ago by the Bureau of Mines, 13,100 B.t.u. per pound of bituminous coal, 13,600 for anthracite, 6,000,000 per barrel of petroleum and 1075 per cubic foot of natural gas. The relative proportions were: Bituminous coal, 60.0 per cent; anthracite, 9.6 per cent; petroleum, 23.9 per cent; natural gas, 6.5 per cent. An addition of one-third to the natural gas would displace more than 3 per cent of the coal, assuming only equal efficiency in realizing the heat units, but the gas should do considerably better than that.

When the gas is piped long distances for domestic use it will frequently if not generally be mixed with gas manufactured from coal or coke. To the old time user of natural gas that is adulteration of the natural gas. To the gas maker it is enriching the manufactured gas, which may not run much over 500 B.t.u. per cubic foot.

The boom in the laying of natural gas lines has played a part worth taking into account in the heavy production of steel during the last 12 months. A 20-inch line 1000 miles long will require from 170,000 to 200,000 net tons of pipe, according to wall thickness, and any long line involves a considerable tonnage of feeder and branch line pipe. A description of the A. O. Smith plant, making electrically welded pipe at Milwaukee, was given in THE IRON AGE of July 11, 1929, pp. 92-4, it being stated that about 100,000 tons of steel a month was being delivered for the manufacture of 26 miles of this pipe daily.

Designing for Low Cost

WHEN a thing can be done in several ways and the least expensive of the acceptable ways is not chosen, there is waste. When, with a free choice of satisfactory materials, one of the more costly is selected, unnecessary expense results. These points are made in a recent article by Morton C. Tuttle, Boston builder, in discussing his industry. Considerations of durability, pleasing appearance, convenience in use and other desirable qualities are assumed to be evaluated in his equation.

"I have observed the building of factories for manufacturing similar metal products," Mr. Tuttle writes, "where some were of brick and timber, some of steel with timber floors, some of steel frame with concrete floors, and others all concrete. Here were four types of structure serving practically like pur-

poses but varying probably 20 per cent in cost. If the less expensive was adequate for its purpose, then, however efficiently the other buildings were erected, they were extravagant."

This same condition is met in manufacturing. It is by cutting corners, where analysis shows they may be cut to advantage, that many dollars are put on the right side of the ledger. But this presupposes competent engineering. The machine must be adequate for its purpose. It must have enough excess strength to allow for the inevitable increase in the loads that will be put upon it—going in many cases far beyond those which it was constructed to bear. The new use of tungsten-carbide tools is a parallel example to the old one of high-speed steel tools, of adding greatly to the stresses imposed on machines which were built before those tools were developed.

Nevertheless, the lesson the Boston builder would impress upon industry will bear repeating. It represents a policy that has become almost axiomatic in the most up-to-date of our industrial establishments. Only by lowering costs of production have the steel companies, in the past five years, been able to earn such dividends as they have paid. Dollars were taken from the cost of making each ton, not only by the Steel Corporation but by its competitors, and at times a good part of this saving was passed along to the buyers in lower prices for the product. The least expensive methods were chosen because they had to be chosen.

Mr. Hoover and the Laws

THE President has put great emphasis upon the necessity for obedience to the laws that have been made, and has pointed out that if we disregard our own laws we are consigning ourselves to destruction, adding that if we do not like the laws we should rescind them. In a way his ideas are reminiscent of what President Grant said to the effect that the best way to abolish a bad law is to enforce it. All of this is quite contrary to our custom of abolishing bad laws by forgetting about them—that is, disregarding them.

This complicated subject probably involves the very roots of our popular form of government. We enact laws in great volume and very many of them reflect no popular will. In the case of laws involving intricate economic and technical questions there is no popular will, inasmuch as 99 per cent or more of the people are entirely ignorant of the subject.

Our laws are largely enacted by trading, or, in the vernacular, by log rolling, and it is far easier to enact them in such a way than it is to undo them. So we continue to have on our statute books the sumptuary laws of the New England States, archaic automobile speed laws, statutes prohibiting the possession of firearms, and many others that are popularly disregarded, but are occasionally invoked when someone has an axe to grind and can make a temporary use of them. The disregard of the 14th and 15th amendments to the Federal Constitution, which began 50 years ago during the administration of President Hayes, is perhaps the most important national example.

But to make a more pointed comment, Mr. Hoover as a mining engineer is thoroughly familiar with the mining laws of the United States and knows how some of their fundamental provisions have been abolished by common consent in the mining districts. No one better than himself knows that if they were strictly observed we should not have a mining industry of the magnitude of the present. He knows, moreover, that the efforts to reform those laws, that have been made during a quarter of a century under the leadership of his own profession, have been a failure. This is, of course, an example of a technical subject about which the public knows little and is incompetent to have any opinion. It is in fact an example of a subject on which Congress ought not to be expected to legislate except in broadest principle.

CORRESPONDENCE

Foreigners Should Pay for Access to the American Market

To the Editor: Let it be noted that the "steel people" who appear at Washington and ask for high duties on what they sell and none on what they buy, as manganese, who find the American a capital fellow to sell to and a reprehensible person to buy from, are not the only people who seem to have this short-sighted idea. Even the down-trodden farmers want duties on farm products, and fertilizer on the free list!

It is time for the country to get rid of these narrow and suicidal ideas. The way to have protection is for everybody to work together and get it, as a national system; not just a series of special favors granted to those who can marshal the most convincing (to the committees) arguments, no matter how specious they themselves may know them to be.

Is it realized how much of a free trade country the United States is? What other country opens its doors so widely to free importations and admits an equal volume of goods duty free? And in that connection it is worth remembering that admission of goods duty free to the largest and highest market in the world is a good deal more than free entry into a small, low market such as most countries offer.

High prices in America are due to high taxes and high taxes are one and the same thing as high civilization and activity. They are inseparable. The American pays taxes far higher than he realizes and is entitled to recover his tax costs when he sells his goods, to leave him enough profit to enable him to do business.

Will somebody please explain in a reasonable way why a foreigner should be given a present of the right to sell goods here free of taxation by National and State Governments, when an American pays dearly for the privilege?

Let it be noted that the iron blast furnaces of the Eastern States, built to supply the domestic market with foundry irons, have been mostly put out of business since the war by increased freight rates and other increases, and that these higher freight rates were necessitated by higher absolute (not apparent only) taxation. The tax items hidden in the cost of a ton of foundry iron, made in America, delivered in Philadelphia, probably equal a good many dollars a ton, which the American producer must pay to make and deliver that iron. Why permit a furnace in India to sell iron in Philadelphia at a tax cost of $1.12½? What is there about the foreign producer that makes him so balky about sharing in the tax costs of this high-level market and entitles him to so much consideration, with none for the American?

ANSON G. BETTS.

West Cummington, Mass., July 25.

Again Block River and Rail Route to Youngstown

The Pittsburgh Coal Co. and its subsidiary, the Montour Railroad Co., both of Pittsburgh, have again been denied by the Interstate Commerce Commission the right to open a new combination river and rail route to connect the Monongahela Valley with the Youngstown district. Some months ago the commission refused to allow the Pittsburgh, Lisbon & Western Railroad, in which the coal company has a controlling interest, to construct two extension that would provide direct rail-and-water connection between Monongahela Valley coal lands and Youngstown. Later the coal company acquired control of the Youngstown Suburban Railroad, which obviated the necessity of building most of the northern extension of the Pittsburgh, Lisbon & Western and sought to have the case reopened.

An entirely new application now probably will be made to the commission, according to H. J. German, president of the Montour Railroad. Although the case is being conducted largely by the coal company and the Montour Railroad, Youngstown district steel companies are greatly interested, as the rail extension would provide Youngstown with direct rail service to the Ohio River and thus allow it to compete with Pittsburgh and Wheeling district companies in the down-river trade.

The Pittsburgh & Lake Erie and Pennsylvania railroads have filed proposed tariff schedules providing for a rate of $1.02 a ton on coal for the haul from Youngstown to the river. The river haul would cost 30c. a ton and, with the cost of transfer from barge to car, the cost of the rail-and-river haul would be higher than the present all-rail rate of $1.34 a ton.

Blaw-Knox Absorbing Steel Casting Co.

Directors of the Blaw-Knox Co., Blawnox, Pa., have ratified a contract with the Union Steel Casting Co., Pittsburgh, providing for exchange of stock whereby control of the Union company will pass to the Blaw-Knox Co. The contract is subject to the depositing by stockholders of the Union company of a sufficient number of shares to constitute control in an amount satisfactory to the Blaw-Knox Co. Similar contracts with the Lewis Foundry & Machine Co., Groveton, Pa., and the National Alloy Steel Co., Blawnox, Pa., have also been ratified by the Blaw-Knox directors.

The Blaw-Knox Co. manufactures transmission towers, concrete road forms, hammer welded steel products, steel floor grating, airplane hangars and a number of other fabricated steel products. The Union Steel Casting Co., a manufacturer of steel castings, also owns the entire capital stock of the Pittsburgh Rolls Corporation, Pittsburgh, which manufactures iron and steel rolls. The Lewis Foundry & Machine Co. is a maker of iron rolls and the National Alloy Steel Co. produces special alloy steel castings. The corporate identity of each of the above companies will be maintained.

Completes Metal Tariff Revision

WASHINGTON, July 30.—Republican members of the Senate Committee on Finance have completed work of revising the metal schedule of the House tariff bill, and while there are numerous reports as to changes, none can be verified. Members of the committee would not discuss the published report that the committee had voted not only to retain a duty on manganese ore but to apply it on concentrates of 10 per cent and more as against the present duty of 1c. a lb. on contained manganese of 30 per cent or more. Whether or not the committee actually has taken this action, the report has created surprise since it had been rather definitely stated that a majority of the Republican members were in favor of either reducing the present duty or removing it altogether and likewise lowering the compensatory duty on ferromanganese.

Cultivation of Structural Steel Mart Bears Fruit

Greater assistance to the fabricators of structural steel in Canada was pledged by Charles F. Abbott, executive director of the American Institute of Steel Construction, New York, in an address before the executives of leading Canadian firms at the Royal York Hotel, Toronto, July 30.

He said, in part: "Trade associations, such as ours, are not limited by the boundaries of a single country. In the development of markets for structural steel the problem in the United States is no different from what it is in Canada. This is especially true, inasmuch as we are primarily concerned with the sale of services—fabrication and erection. Members in Canada are just now very active, but not much more so than the fabricators of structural steel in the United States. Since the institute was organized in 1922 the annual tonnage of our members has more than doubled.

"This great increase in business has been due largely to the efforts we have made to standardize practices and to eliminate industrial waste. The results have been tangible savings to the builder and owner of a steel structure. Practically all the important cities in Canada and the United States have revised their building codes to conform to the recommendations our institute has proposed. Our present research activities promise to increase the use of structural steel to a much greater extent. The steel plate floor for bridges and buildings, making possible taller skyscrapers; steel hangars, which are increasing rapidly as the demands of aviation begin to be felt, and steel dams, of which the greatest developments are in the future, promise to multiply our tonnage several times over again.

"In this work the Canadian fabricators of structural steel have wholeheartedly cooperated in making possible research and market development that is proving highly beneficial to the industry in both countries. Firms that have shown the foresight to support the work of this association are those which the banker, the architect and the owner are beginning to classify as dependable. Our daily mail at our New York and Cleveland offices, and at the district offices established at strategic points throughout Canada and the United States, bears witness of this fact, for the institute is being called upon more and more to advise with buyers of steel structures."

Prest-O-Lite Starts Two New Plants

The Prest-O-Lite Co. has recently added two new acteylene gas plants located at 540 East Seventeenth Street, Wichita, Kan., and at Jones Street and Pennsylvania Railroad, Youngstown, Ohio. These plants will supply local industry with dissolved acetylene for oxy-acetylene welding and cutting. These two increase the number operated by the Prest-O-Lite Co. to 45 gas producing plants, situated in as many industrial centers.

New Detroit Company to Make Cold-Rolled Strip

A. J. Bopp, who has been Detroit district sales agent for the Weirton Steel Co. since 1917, has resigned to form the A. J. Bopp Steel Corporation, which will engage in the manufacture of cold-rolled strip steel, specializing in narrow light-gage material.

A plant site has been purchased in Detroit and contracts for building and equipment will be closed soon.

Fittings for Tubular Booms

American Marine Standards H30-1928 and H31-1929 relate to steel fittings for tubular steel cargo booms, The standards cover both the hinge fitting at the heel of the boom and the sheave fitting, or cap, at the outer end of the boom. Detailed dimensions, adopted as standard, are given in the pamphlet for booms for capacities of 5, 10, 15, 20 and 30 tons. Copies may be obtained for 5c. each from the Government Printing Office, Washington.

Iron and Steel Markets

August Outlook Promising

No Important Recession in Steel Output Indicated—Chicago Mill Bookings Gain—Automobile Industry to Take More Steel in Next Two Months

THE end of July has disclosed no marked recession from the high rate of steel output that has prevailed since early in the year. It is taken for granted that production statistics for the past month will indicate a new July record in steel ingots and an average operating rate approaching that of June. Present interest is not in past performance, but rather in the prospects for coming months.

At Pittsburgh there are evidences of gradual curtailment of steel works activities, although thus far reductions in open-hearth operations have been confined to smaller companies specializing in a few rolled products. Reports from other steel centers, although reflecting slower specifications for certain finished materials, indicate no current or imminent slackening in ingot output.

The Bethlehem Steel Corporation, according to a statement by President Grace, will continue to run at close to capacity throughout August. Chicago mills are not only holding their own, but are increasing their backlogs. Their sales of plates, shapes and bars were 50 per cent heavier than in the previous week, when bookings were fully abreast of the average to date this year. At Cleveland, sheet orders of some mills were larger than the total tonnage for the three preceding weeks of the month.

A particularly good augury, in view of the recent decline in demand for automobile steels, is the fact that motor car makers have arranged shipping schedules for August and September that, for the most part, call for more steel than was delivered to them during the past month. While the Chevrolet Motor Car Co. has reduced its production, the trend among other companies is upward.

The encouraging outlook in steel is commanding special attention in view of the importance of a high rate of operations in terms of steel company profits, as revealed by the quarterly report of the United States Steel Corporation. With prices over the first half of this year (measured by THE IRON AGE composite price for finished steel) averaging only 2¼ per cent higher than those of the first half of 1928, but with production 17 per cent higher this year than last, total earnings went up over 50 per cent, the showing of the first two quarters of the Steel Corporation this year being $132,101,000 and for the same quarters last year $87,867,000.

Competition by Alabama producers for pig iron business in Northern and Eastern markets has accentuated, rather than diminished. Southern basic iron has been quoted at $13 a ton, Birmingham, and less in recent bids for eastern Pennsylvania tonnage. Under this pressure, prices of furnaces in the Philadelphia district are giving ground, as evidenced by concessions of 50c. to $1 a ton from recent quotations on foundry grade. Buffalo producers, on the other hand, having accumulated substantial backlogs, are taking a stronger price position, and the situation with other furnaces on the Great Lakes is satisfactory.

The large demand for pipe for gas lines accounts, in large measure, for the unusual pressure on Chicago plate mills and the overflow of considerable plate tonnage to producers farther east. The placing of 250,000 tons of pipe by Henry L. Doherty & Co., New York, for a gas line from Texas to Chicago is in early prospect. The National Tube Co. has booked 8000 tons of 10 and 12-in. pipe for a line of the Southwestern Gas Co.

Of seasonal significance is an increase in bar specifications from the farm equipment industry, following the completion of inventories.

The construction outlook is promising. The award of 14,000 tons by the Pennsylvania Railroad for a Hackensack River bridge is imminent, and bids on a New York subway section, taking 13,200 tons, will be opened Aug. 2. Structural steel requirements for the Illinois Steel Co.'s expansion program at Gary are estimated at 40,000 to 50,000 tons. Fabricated steel lettings for the week were of average proportions, totaling 33,000 tons. Fresh inquiries called for 36,000 tons.

Rail mill operations continue to taper, now averaging 72 per cent of capacity at Chicago. Demand for track supplies is excellent, however, with new bookings of 7000 tons reported in that district and an inquiry for 6000 tons of tie plates from the New York, New Haven & Hartford pending. The New Haven will also buy rails.

With mill backlogs declining in some products, more is heard of price shading, although market levels as a whole are being maintained. In the Central West weakness in wire nails has become more general, with sales at $2.60 a keg, Cleveland or Pittsburgh, a drop of $1 a ton from the recent minimum. A few mills are competing more aggressively for galvanized sheets, on which 3.50c., Pittsburgh, the price to jobbers, has been extended in certain cases to consumers.

Scrap is buoyant at Pittsburgh, Chicago and other centers, with prices pointing upward.

Exports of rolled and finished steel in the first half, at 1,149,000 tons, showed a gain of 21 per cent over the total for the corresponding period last year.

THE IRON AGE pig iron composite has fallen to $18.38 a ton from the $18.42 of the last two weeks. The finished steel composite remains at 2.412c. a lb.

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous, Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	July 30, 1929	July 23, 1929	July 2, 1929	July 31, 1928
No. 2 foundry, Philadelphia	*$21.26*	$21.76	$21.76	$20.26
No. 2, Valley furnace	18.50	18.50	18.50	16.50
No. 2 Southern, Cin'ti	17.69	17.69	18.69	19.19
No. 2, Birmingham	14.50	14.50	15.00	15.50
No. 2 foundry, Chicago*	20.00	20.00	20.00	17.50
Basic, del'd eastern Pa.	*20.00*	20.25	20.25	19.00
Basic, Valley furnace	18.50	18.50	18.50	16.00
Valley Bessemer, del'd P'gh	20.76	20.76	20.76	18.76
Malleable, Chicago*	20.00	20.00	20.00	17.50
Malleable, Valley	19.00	19.00	19.00	17.00
Gray forge, Pittsburgh	19.76	19.76	19.76	18.01
L. S. charcoal, Chicago	27.04	27.04	27.04	27.04
Ferromanganese, furnace	105.00	105.00	105.00	105.00
Rails, Billets, etc., Per Gross Ton:				
Rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Rerolling billets, Pittsburgh	35.00	35.00	35.00	32.00
Sheet bars, Pittsburgh	35.00	35.00	35.00	32.00
Slabs, Pittsburgh	35.00	35.00	35.00	32.00
Forging billets, Pittsburgh	40.00	40.00	40.00	38.00
Wire rods, Pittsburgh	42.00	42.00	42.00	42.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.85	1.85	1.85	1.85
Finished Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.95	1.95	1.95	1.85
Bars, Chicago	2.05	2.05	2.05	2.00
Bars, Cleveland	1.95	1.95	1.95	1.85
Bars, New York	2.29	2.29	2.29	2.19
Tank plates, Pittsburgh	1.95	1.95	1.95	1.85
Tank plates, Chicago	2.05	2.05	2.05	2.00
Tank plates, New York	2.22½	2.22½	2.22½	2.17½
Structural shapes, Pittsburgh	1.95	1.95	1.95	1.85
Structural shapes, Chicago	2.05	2.05	2.05	2.00
Structural shapes, New York	2.19½	2.19½	2.19½	2.14½
Cold-finished bars, Pittsburgh	2.30	2.30	2.30	2.10
Hot-rolled strips, Pittsburgh	1.90	1.90	1.90	1.75
Cold-rolled strips, Pittsburgh	2.75	2.75	2.75	2.90

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Finished Steel,	July 30, 1929	July 23, 1929	July 2, 1929	July 31, 1928
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	2.85	2.85	2.85	2.60
Sheets, black, No. 24, Chicago dist. mill	3.05	3.05	3.05	2.75
Sheets, galv., No. 24, P'gh	3.60	3.60	3.60	3.40
Sheets, galv., No. 24, Chicago dist. mill	3.80	3.80	3.80	3.60
Sheets, blue, No. 13, P'gh	2.35	2.35	2.35	2.10
Sheets, blue, No. 13, Chicago dist. mill	2.45	2.45	2.45	2.20
Wire nails, Pittsburgh	*2.60*	2.65	2.65	2.55
Wire nails, Chicago dist. mill	*2.65*	2.70	2.70	2.60
Plain wire, Pittsburgh	2.50	2.50	2.50	2.40
Plain wire, Chicago dist. mill	2.55	2.55	2.55	2.45
Barbed wire, galv., Pittsburgh	3.30	3.30	3.30	3.20
Barbed wire, galv., Chicago dist. mill	3.35	3.35	3.35	3.25
Tin plate, 100 lb. box, P'gh	$5.35	$5.35	$5.35	$5.25
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	$18.75	$18.75	$18.25	$14.25
Heavy melting steel, Phila	16.50	16.50	16.50	13.00
Heavy melting steel, Ch'go	14.75	14.75	14.75	12.50
Carwheels, Chicago	14.00	14.00	14.00	12.75
Carwheels, Philadelphia	16.50	16.50	16.00	15.50
No. 1 cast, Pittsburgh	15.50	15.50	15.50	14.25
No. 1 cast, Philadelphia	16.50	16.50	16.50	15.50
No. 1 cast, Ch'go (net ton)	14.50	14.50	14.50	13.50
No. 1 RR. wrot., Phila	16.00	16.00	16.00	13.50
No. 1 RR. wrot., Ch'go (net)	13.50	13.50	13.50	10.75
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	$2.75	$2.75	$2.75	$2.75
Foundry coke, prompt	3.75	3.75	3.75	3.75
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	18.12½	18.12½	18.12½	14.75
Electrolytic copper, refinery	17.75	17.75	17.75	14.50
Tin (Straits), New York	47.25	47.25	44.62½	47.75
Zinc, East St. Louis	6.80	6.80	6.70	6.20
Zinc, New York	7.15	7.15	7.05	6.55
Lead, St. Louis	6.55	6.55	6.80	6.00
Lead, New York	6.75	6.75	7.00	6.20
Antimony (Asiatic), N. Y.	8.62½	8.75	8.75	10.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Expect Curtailed Operations By Mid-August With Better Business in September

PITTSBURGH, July 30.—July has been an exceptionally busy month for Pittsburgh district steel companies, but they will enter August with the declining tendency in specifications unchecked and an almost certain curtailment in operations before the middle of the new month. As it looks now such a curtailment will not be pronounced and will be followed by improved business during September.

Local steel makers, who have expected a falling off in steel demand for several weeks, are well pleased with the rate of business in July and are inclined to view with some favor the prospect of a slight slowing down during August. Operating facilities are feeling the strain of protracted capacity production more than ever now that hot weather has become a factor in output, and a longer breathing spell than is expected next month would be required to prepare the mills for a resumption of activity in the fall comparable to the record of the last four months.

Hot weather interfered with production during the last week, notably in the sheet and tin mill departments. As tonnage releases on sheets have shown very little decline, mills had no opportunity to improve their shipments, and deliveries on the common finishes of sheets are little better than they were a month ago. The same is true of plates, but on other products operations are on about a two-weeks basis, with high production justified only by an exceptionally heavy summer demand.

Wire specifications last week maintained the month's lead over the corresponding period in June, particularly in manufacturers' wire. Weekly tin plate specifications are sufficient to justify a 90 per cent of capacity operation by all leading makers.

Current demand for reinforcing bars is strong, but the requirements of cold-finishing mills are lighter and alloy steel bar shipments have declined sharply. Structural awards in this district are negligible, but large fabricators are well supplied with business and there are a number of large projects in prospect. An order for 20 barges requiring about 3000 tons of steel is said to have been placed recently with a local fabricator.

Prices show no additional weakness. Mills are taking a firmer stand in view of an expected improvement in demand by the end of August and are refusing to meet lower prices than 2.85c., Pittsburgh, on black sheets and 3.60c. on galvanized except to large jobbers. On wire nails large Pittsburgh jobbers have not been able to buy at less than 2.65c.

There is little activity in pig iron and sales are confined almost entirely to fill-in tonnage sufficient to carry melters through August. Prices are holding exceptionally well. The scrap market has also maintained its recent strength in the face of practically no mill buying.

Pig Iron.—Sales continue at about the level of recent weeks with business confined almost entirely to small lots for shipment during August. It

now seems certain that large buyers in the district are not going into the market for third-quarter tonnage of any size, but rather are buying in small lots which, together with iron due them on old contracts, will be sufficient for August requirements. In some quarters it is thought that a buying movement of considerable proportions will develop during September. The Standard Sanitary Mfg. Co. has made small purchases for its Pittsburgh and New Brighton, Pa., plants, but the total in neither case ran more than 1500 tons; at least three furnaces shared in this business and full market prices were obtained. Shipments are keeping up fairly well for this time of the year and there is little opportunity for furnace stocks to accumulate. In many cases aggregate sales of local agents for the week are entirely sufficient to take the output of the furnace which they represent. Prices are well established at $18.50, Valley, for foundry and basic iron, and $19 for malleable and Bessemer. A Pittsburgh district furnace is quoting prices 50c. over these figures.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$18.50
Bessemer	19.00
Gray forge	18.00
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	19.00
Low phos., copper free	27.00

Freight rate to Pittsburgh or Cleveland district, $1.76.

Prices per gross ton, f.o.b. Pittsburgh district furnace:

Basic	$19.00
No. 2 foundry	19.00
No. 3 foundry	18.50
Malleable	19.50

Freight rates to points in Pittsburgh district range from 63c. to $1.13.

Semi-Finished Steel.—Hot weather has affected steel production adversely in the last week, but correspondingly reduced demand from finishing mills has prevented any shortage. However, the supply of unfinished steel in this and nearby districts is still sufficient only to meet current demand and producers have not yet had the opportunity to accumulate stocks which they would normally maintain. Some of the smaller mills in the district whose open-hearth output goes into only one or two products have recently taken out furnaces, but the larger interests are still holding production at as near physical capacity as possible. Semi-finished steel is not being freely offered in the open market, but it is now nearly always possible to purchase spot tonnage in case of urgent demand. Large users of sheet bars have their requirements for this quarter under contract, but consumers of billets and slabs are reported to be delaying their commitments until the price is definitely settled. At present sheet bars, billets and slabs are generally quoted at $35, Pittsburgh or Youngstown, although a few makers with limited quantities for sale are asking a dollar more on spot tonnage. Wire rods are unchanged at $42, Pittsburgh or Cleveland, and the movement is very satisfactory for this time of the year.

Rails and Track Supplies.—The New York, New Haven & Hartford Railroad is expected to close this week on an unstated rail tonnage and is also inquiring for 5000 to 6000 tons of tie plates. Otherwise this market is rather quiet and little activity is expected before September. Specifications on contract business are coming in well for the summer period, but shipments have been tapering off gradually for several weeks. Prices are being regularly adhered to, except in the case of light rails, on which concessions are being made to meet the price of the rerolled product.

Bars, Shapes and Plates.—Tonnage releases on bars and shapes continue to taper, but local producers find demand for plates almost as strong as it was earlier in the spring, allowing little opportunity for improved deliveries. Mills are booked for six to eight weeks, and reports are current that the tight situation in Chicago is again forcing large consumers in that district to seek tonnage in this territory. Car builders in this district are still specifying plates freely, and an order for 20 barges reported to have been placed during the week will further extend the backlogs of local barge builders. Demand for bars has felt the summer lull this month, and backlogs of all mills have been substantially reduced. The cold-finishing mills are requiring considerably less steel than they were in June, and shipments of alloy steel bars have declined materially. Reinforcing bars are holding up well, and, although large tonnage awards have been lacking in the last two weeks, the volume of small business has been gratifying. Prospective structural business bulks large. An addition to the Bell Telephone Building in Pittsburgh will require about 3000 tons and another office building under consideration will take a greater tonnage. A local fabricator has been awarded 2000 tons of structural steel for two railroad bridges in Indiana. Prices on the heavy hot-rolled products show little if any weakness, with 1.95c., Pittsburgh, the ruling quotation.

Wire Products.—Shipments of manufacturers' wire during July will be fully equal to those of June, and one maker reports a gain this month of at least 10 per cent. Specifications are coming in at a high rate for this season. Other wire products are quiet, with demand for barbed wire and other agricultural products considerably reduced. Wire prices are well maintained at 2.50c. to 2.60c., Pittsburgh or Cleveland. Wire nails show little improvement and reports persist that prices are being sharply reduced at points down the Ohio River. However, large Pittsburgh jobbers have not been able to buy nails at less than 2.65c., Pittsburgh, and a $2 premium is occasionally required on small tonnages.

Tubular Goods.—The pipe market is alive with reports of large prospective gas lines, and, although local mills are not inclined to give credence to many of the current stories, it seems definitely assured that the development of electrically welded pipe has opened up unusual possibilities for the piping of natural gas to large centers of population. A second line into Chicago from the Texas fields, which would require at least 200,000 tons of pipe, is considered quite active, and in view of the heavy tonnage booked last week by the Milwaukee fabricator, makers of lap-welded tubing in the Pittsburgh and Youngstown districts expect to share in this business if it is placed. A gas line into New York and

The Iron Age Composite Prices

Finished Steel

July 30, 1929, 2.412c. a Lb.

One week ago	2.412c.
One month ago	2.412c.
One year ago	2.319c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products make 87 per cent of the United States output of finished steel.

	High			Low	
1929	2.412c.,	April 2;	2.391c.,	Jan. 8
1928	2.391c.,	Dec. 11;	2.314c.,	Jan. 3
1927	2.453c.,	Jan. 4;	2.293c.,	Oct. 25
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18

Pig Iron

July 30, 1929, $18.38 a Gross Ton

One week ago	$18.42
One month ago	18.63
One year ago	17.04
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High			Low	
1929	$18.71,	May 14;	$18.29,	March 19
1928	18.59,	Nov. 27;	17.04,	July 24
1927	19.71,	Jan. 4;	17.54,	Nov. 1
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.95c.
F.o.b. Chicago	2.05c.
Del'd Philadelphia	2.27c.
Del'd New York	2.29c.
Del'd Cleveland	1.92½c. to 1.95c.
F.o.b. Cleveland	1.90c. to 1.95c.
F.o.b. Lackawanna	2.05c.
F.o.b. Birmingham	2.15c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills, 40, 50, 60-ft.	2.05c.
F.o.b. Pittsburgh mills, cut lengths	2.30c.
F.o.b. Birmingham, mill lengths	2.15c.

Rail Steel

F.o.b. mills, east of Chicago dist.	1.85c. to 1.90c.
F.o.b. Chicago Heights mill	1.95c.
Del'd Philadelphia	2.27c.

Iron

Common iron, f.o.b. Chicago	2.05c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.95c.
F.o.b. Chicago	2.05c.
F.o.b. Birmingham	2.15c.
Del'd Cleveland	2.14c.
Del'd Philadelphia	2.15c.
F.o.b. Coatesville	2.05c.
F.o.b. Sparrow Point	2.05c.
F.o.b. Lackawanna	2.05c.
Del'd New York	2.22½c.
C.i.f. Pacific ports	2.35c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.95c.
F.o.b. Chicago	2.05c.
F.o.b. Birmingham	2.15c.
F.o.b. Lackawanna	2.05c.
F.o.b. Bethlehem	2.05c.
Del'd Cleveland	2.14c.
Del'd Philadelphia	2.01c. to 2.06c.
Del'd New York	2.14½c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, P'gh	2.00c.
Wider than 6 in., P'gh	1.90c.
6 in. and narrower, Chicago	2.20c.
Wider than 6 in., Chicago	2.10c.
Cooperage stock, P'gh	2.20c.
Cooperage stock, Chicago	2.30c.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill	2.30c.
Bars, f.o.b. Chicago	2.30c.
Bars, Cleveland	2.35c.
Shafting, ground, f.o.b. mill	*2.65c. to 3.60c.
Strips, P'gh	2.75c.
Strips, Cleveland	2.75c.
Strips, del'd Chicago	3.05c. to 3.15c.
Strips, Worcester	2.90c. to 3.00c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	4.25c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland, to jobbers and retailers.)

	Base per Keg
Wire nails	$2.60 to $2.75
Galvanized nails	4.65 to 4.75
Galvanized staples	3.35 to 3.45
Polished staples	3.10 to 3.20
Cement coated nails	2.65 to 2.75

	Base per 100 Lb.
Bright plain wire, No. 6 to No. 9 gage	$2.50 to $2.60
Annealed fence wire	2.65 to 2.75
Spring wire	3.50 to 3.60
Galv'd wire, No. 9	3.10 to 3.20
Barbed wire, galv'd	3.30 to 3.40
Barbed wire, painted	3.05 to 3.15
Woven wire fence (per net ton to retailers)	65.00

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass. (wire), mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Cut Nails

	Per 100 Lb.
Carloads, Wheeling, Reading or Northumberland, Pa.	$2.70
Less carloads, Wheeling or Reading	2.80

Light Plates

No. 10, blue annealed, f.o.b. P'gh.	2.10c. to 2.20c.
No. 10, blue annealed, f.o.b. Chicago dist.	2.30c.
No. 10, blue annealed, del'd Phila.	2.42c. to 2.52c.
No. 10, blue annealed, B'ham	2.35c.

Sheets

Blue Annealed

	Base per Lb.
No. 13, f.o.b. P'gh	2.25c. to 2.35c.
No. 13, f.o.b. Chicago dist.	2.45c.
No. 13, del'd Philadelphia	2.67c.
No. 13, blue annealed, B'ham	2.50c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.85c.
No. 24, f.o.b. Chicago dist. mill	3.05c.
No. 24, del'd Philadelphia	3.17c. to 3.27c.
No. 24, f.o.b. Birmingham	3.00c. to 3.10c.

Metal Furniture Sheets

No. 24, f.o.b. P'gh	4.10c. to 4.20c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.50c. to 3.60c.
No. 24, f.o.b. Chicago dist. mill	3.80c.
No. 24, del'd Cleveland	3.69c. to 3.79c.
No. 24, del'd Philadelphia	3.92c. to 4.02c.
No. 24, f.o.b. Birmingham	3.75c. to 3.85c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.90c. to 3.00c.
No. 28, f.o.b. Chicago dist. mill	3.10c.

Automobile Body Sheets

No. 28, f.o.b. Pittsburgh	4.10c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill	4.00c.

Vitreous Enameling Stock

No. 24, f.o.b. Pittsburgh	3.90c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.35
Standard cokes, f.o.b. Gary	5.45

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)
(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$11.20
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.30
25-lb. coating I.C.	$16.70
30-lb. coating I.C.	17.75
40-lb. coating I.C.	19.85

Alloy Steel Bars

(F.o.b. makers' mill)

Alloy Quality Bar Base, 2.65c. to 2.75c. per Lb.

S.A.E. Series Numbers		Alloy Differential
2000	(1¼% Nickel)	0.25
2100	(1¾% Nickel)	0.55
2300	(3½% Nickel)	1.50
2500	(5% Nickel)	2.25
3100	Nickel Chromium	0.55
3200	Nickel Chromium	1.35
3300	Nickel Chromium	3.80
3400	Nickel Chromium	3.20
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	1.05
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100	Chromium Spring Steel	0.20
6100	Chromium Vanadium Bars	1.20
6100	Chromium Vanadium Spring Steel	0.95
9250	Silicon Manganese Spring Steel (flats)	0.25
	Rounds and squares	0.50
	Chromium Nickel Vanadium	1.50
	Carbon Vanadium	0.95

Above prices are for hot rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is ¾c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base per 100 Lb.
Spikes, ⅜ in. and larger	$2.80
Spikes, ½ in. and smaller	2.80
Spikes, boat and barge	3.00
Tie plate, steel	2.15
Angle bars	$2.75
Track bolts, to steam railroads	$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ and ⅜	+11	+36
¼ to ⅜	51	25½	½	23	5
½	56	42½	¾	28	11
¾	60	48½	1 and 1¼	31	15
1 to 3	62	50½	1½ and 2	35	18

Lap Weld

2	55	43½	2	23	9
2½ to 6	59	47½	2½ to 3½	28	13
7 and 8	56	43½	4 to 6	30	17
9 and 10	54	42½	7 and 8	29	16
11 and 12	53	40½	9 to 12	26	11

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ and ⅜	+13	+48
¼ to ⅜	47	30½	½	23	7
½	53	42½	¾	28	12
¾	58	47½	1 to 2	34	18
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2½	29	13
2½ to 4	57	46½	2½ to 4	34	20
4½ to 6	56	45½	4½ to 6	33	19
7 to 8	52	39½	7 and 8	31	17
9 and 10	45	32½	9 to 12	21	8
11 and 12	44	31½			

On carloads the above discounts on steel pipe are increased on block by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼ in.	40	1½ in.	1
2½ in.—2¾ in.	48	1¾ in.	8
3 in.	54	2 in.—2¼ in.	13
3¼ in.—3¾ in.	56	2½ in.—2¾ in.	16
4 in.	59	3 in.	17
4½ in. to 6 in.	48	3¼ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	63	3 in.	48
1¼ to 1½ in.	55	3¼ to 3½ in.	50
1¾ in.	39	4 in.	53
2 to 2¼ in.	34	4½, 5 and 6 in.	42
2½ to 2¾ in.	42		

Hot Rolled

2 and 2¼ in.	40	3¼ to 3½ in.	56
2½ and 2¾ in.	48	4 in.	59
3 in.	54	4½, 5 and 6 in.	48

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb. base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage take mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base (carloads)	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

other Eastern cities is under consideration, and although such a line would likely originate in West Virginia, a much more distant field is being considered. As mentioned in THE IRON AGE last week, a part of the feeder pipe required for the Southwestern Gas Co. line running from Monroe, La., to Birmingham, Ala., and Atlanta, Ga., was placed with the Republic Iron & Steel Co., to be made by the electrical welding process. The 10-in. and 12-in. pipe required for this line has been placed with the National Tube Co., the requirements being about 8000 tons. Seamless pipe is fairly active, with mills in the district operating at around 75 per cent of rated capacity. Mechanical and boiler tubing are also moving steadily.

Sheets.—Hot weather interfered with sheet production during the last week, but operations held at close to 95 per cent of capacity. Tonnage releases on all finishes of sheets continue large, and capacity output during August would not completely dispose of mill commitments. The price situation is unchanged, with galvanized sheets quotable at 3.50c. to 3.60c., Pittsburgh, and black at 2.85c. Companies producing blue annealed sheets on jobbing mills refuse to take business on the No. 10 base at less than 2.20c., Pittsburgh, but makers of wide strips are freely making concessions of $2 or more a ton. On the No. 13 gage base, concessions from the 2.35c., Pittsburgh, price are not common.

Tin Plate.—Weekly specifications justify 90 per cent operations, with most makers and mills holding at about that rate. This is considered very satisfactory for the summer months, and crop reports from most parts of the country justify the belief that current demand will not taper off very much during August.

Strip Steel.—Demand for strip steel is spotty and few makers are able to maintain well-rounded production. Companies serving the two large makers of low-priced automobiles have heavy commitments on certain sizes and widths, but are able to make deliveries in a week or two on other sizes. In some cases specifications this month are running ahead of June, but these are exceptional and most mills would consider a July tonnage as high as June more than satisfactory. No further price weakness is reported, hot-rolled material holding at 1.90c. and 2c., Pittsburgh, and cold-rolled at 2.75c.

Coal and Coke.—Demand for furnace coke is seasonably dull, and the leading interest in the Connellsville region has taken out a number of ovens. Independent producers have also curtailed slightly. Prices on the furnace grade are unchanged at $2.75 to $2.85, Connellsville, with slightly higher quotations ruling on future requirements. Shipments of foundry coke are probably at the low point of the year, with prices generally weak on all except the premium grades. The coal market is without feature, unless the continued chaotic price situation might be considered as such.

Warehouse Business.—Movement of steel out of warehouse stocks is fairly satisfactory for this time of the year, with activity well distributed throughout the various lines. Galvanized corrugated sheets are moderately active and demand for reinforcing bars is good. New extras on cold-finished steel bars, which were recently announced by mills, will have no effect on warehouse prices before the third quarter. Jobbers are now selling blue annealed sheets on the two bases established some time ago by the mills, with the No. 10 gage quoted at 3.45c. per lb. in lots of 1 to 10 sheets, and the No. 13 gage at 3.60c. per lb. Warehouse prices on wire nails have developed weakness, and nails are now quotable at $2.90 to $3, base, per keg.

Old Material.—Despite a week of exceptionally light activity, the scrap market has retained its strength, and although quotations cannot be changed on the basis of actual sales, the tendency seems to be toward higher prices. High quotations on the heavy grades of steel have forced up prices on the light materials and developed a scarcity in such products as short shoveling steel turnings and machine shop turnings. Compressed sheets are very tight as buying prices in Detroit have advanced, and heavy water movement from that point is diverting tonnage which might ordinarily come to Pittsburgh into other territories. No sales of compressed sheets at higher than $18.50 have been reported in this district, but dealers are forced to pay a price at Detroit which figures to $18.50, delivered Pittsburgh, without the ordinary brokers' commission. Specialties continue scarce and heavy steel axle turnings have advanced 25c. on a recent sale. There are hold-ups at two consuming points in this district but other large plants are requiring scrap at an undiminished rate, and if steel operations continue at the present schedules through the early part of August, an even stronger scrap market is expected. Bids will be taken on Aug. 7 on the July Pennsylvania Railroad list, which contains 55,000 tons. The Baltimore & Ohio list, which closes Aug. 5, contains 18,400 tons.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$18.50 to $19.00
No. 2 heavy melting steel	16.50 to 17.00
Scrap rails	18.00 to 18.50
Compressed sheet steel	18.00 to 18.50
Bundled sheets, sides and ends	17.00 to 17.50
Cast iron carwheels	16.50 to 17.00
Sheet bar crops, ordinary	19.50 to 20.00
Heavy breakable cast	13.00 to 13.50
No. 2 railroad wrought	18.50 to 19.00
Hvy. steel axle turnings	16.50 to 17.00
Machine shop turnings	12.00 to 12.50
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	21.50 to 22.00
Railr. coil and leaf springs	21.50 to 22.00
Rolled steel wheels	21.50 to 22.00
Low phos. billet and bloom ends	22.50 to 23.00
Low phos., mill plates	22.50 to 23.00
Low phos., light grades	20.50 to 21.50
Low phos., sheet bar crops	20.50 to 21.50
Heavy steel axle turnings	16.50 to 17.00
Electric Furnace Grades:	
Low phos., punchings	20.00 to 21.00
Hvy. steel axle turnings	16.50 to 17.00
Blast Furnace Grades:	
Short shoveling steel turnings	12.50 to 13.00
Short mixed borings and turnings	12.50 to 13.00
Cast iron borings	12.50 to 13.00
Rolling Mill Grades:	
Steel car axles	21.50 to 22.00
Cupola Grades:	
No. 1 cast	15.00 to 16.00
Rails 3 ft. and under	20.00 to 21.00

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.25c.
Hoops	4.25c.
Black sheets (No. 24), 25 or more bundles	3.80c.
Galv. sheets (No. 24), 25 or more bundles	4.55c.
Light plates, blue ann'l'd, (No. 10), 1 to 10 plates	3.45c.
Blue annealed sheets (No. 13), 1 to 10 sheets	3.60c.
Galv. corrug. sheets (No. 28), per square	$4.43
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	60 per cent off list
Machine bolts, 100 count,	60 per cent off list
Carriage bolts, 100 count,	60 per cent off list
Nuts, all styles, 100 count,	60 per cent off list
Large rivets, base per 100 lb.	$3.50
Wire, black soft ann'l'd, base per 100 lb.	$3.00 to 3.10
Wire, galv. soft, base per 100 lb.	3.00 to 3.10
Common wire nails, per keg	2.90 to 3.00
Cement coated nails, per keg	3.05

To Make High-Strength Iron Castings

Davies & Thomas Co., Catasauqua, Pa., and William Sargent, Newark, N. J., have taken licenses from a group of German firms to manufacture high-strength iron castings under the so-called "Perlit" process. The first-named firm is now adapting its foundry for production, which will start in the near future.

The Third National Fuels Meeting, to be held in Philadelphia, Oct. 7-10, will have a series of papers on the domestic heating plant. The domestic use of gas, oil, electricity, anthracite and bituminous coal and coke will be covered.

"Oil Heat" is the title of a booklet issued by the Oil Heating Institute, 342 Madison Avenue, New York, and devoted to the use of oil-burning equipment for domestic purposes. It is illustrated with both line cuts and half-tones, the former using color.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

Billets and Blooms

	Per Gross Ton
Rerolling, 4 in. and under 10 in., Pittsburgh	$35.00
Rerolling, 4 in. and under 10 in., Youngstown	35.00
Rerolling, 4 in. and under 10 in., Cleveland	35.00
Rerolling, 4 in. and under 10 in., Chicago	37.00
Forging quality, Pittsburgh	$40.00 to 41.00

Sheet Bars

(Open Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$35.00
Youngstown	35.00
Cleveland	35.00

Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$35.00
Youngstown	35.00
Cleveland	35.00

Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.85c. to 1.90c.
Universal	1.85c. to 1.90c.
Sheared	1.85c. to 1.90c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$42.00
Cleveland	42.00
Chicago	43.00

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian	10.00c.
Iron ore, low phos., Swedish, average 68% iron	10.00c.
Iron ore, basis Swedish, average 65% iron	9.00c.
Manganese ore, washed, 52% manganese, from the Caucasus	33.00c. to 35.00c.
Manganese ore, Brazilian, African or Indian, basic 50%	33.00c. to 35.00c.
Tungsten ore, high grade, per unit, in 60% concentrates	$15.00 to $15.50
	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00
	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.75 to $2.85
Foundry, f.o.b. Connellsville prompt	3.75 to 4.85
Foundry, by-product, Ch'go ovens	8.00
Foundry, by-product, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, delivered	9.00 to 9.40
Foundry, by-product, Phila.	9.00
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry by-prod., del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.25 to $1.75
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Gas coal, ¾-in. f.o.b. Pa. mines	1.90 to 2.00
Mine run gas coal, f.o.b. Pa. mines	1.65 to 1.75
Steam slack, f.o.b. W. Pa. mines	80c. to 90c.
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.10

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	$105.00
Foreign, 80%, Atlantic or Gulf port, duty paid	105.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$31.00 to $34.00
Domestic, 16 to 19%	29.00 to 32.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50
75%	130.00

Per Gross Ton Furnace		Per Gross Ton Furnace	
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	45.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
10%	$30.00	12%	$34.00
11%	32.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
6%	$23.00	10%	$27.00 to $28.00
7%	24.00	11%	29.00 to 30.00
8%	25.00	12%	31.00 to 32.00
9%	26.00		

Other Ferroalloys

Ferrotungsten, per lb., contained metal del'd	$1.40 to $1.50
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	$91.00
Ferrophosphorus, electric 24%, f.o.b. Anniston, Ala., per gross ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	$18.00
No. 2 lump, Illinois and Kentucky mines	20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$18.00 to $18.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	32.50

Fire Clay Brick

	Per 1000 f.o.b. Works	
	High-Heat Duty Brick	Intermediate Heavy Duty Brick
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	.....
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Standard size	45.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagons	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including ⅛ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagons nuts	70
Semi-finished hexagons castellated nuts, S.A.E.	70
Stove bolts in packages, P'gh	75, 20, 10 and 5
Stove bolts in packages, Chicago	75, 20, 10 and 5
Stove bolts in packages, Cleveland	75, 20, 10 and 5
Stove bolts in bulk, P'gh	75, 20, 10, 5 and 2½
Stove bolts in bulk, Chicago	75, 20, 10, 5 and 2½
Stove bolts in bulk, Cleveland	75, 20, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55, 60 per cent apply.

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$3.10
F.o.b. Chicago	3.20

Small Rivets

(7/16-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 10
F.o.b. Cleveland	70 and 10
F.o.b. Chicago	70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 5
Milled standard set screws, case hardened	80 and 5
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S. thread	85
Upset hex. cap screws, S.A.E. thread	85
Upset set screws	80, 10 and 5
Milled studs	70

Chicago

Bookings of Steel Mills Growing—No Pre-Autumn Recession Looked For—Wire Nails Weak

CHICAGO, July 30.—Sales of plates, shapes and bars are fully 50 per cent heavier than in the previous week, when new purchases were abreast of the average for the year. Lower rolling schedules in rail mills and reduced demands for automobile steels have simplified the problem of distributing steel among finishing departments. No longer handicapped by the allocation of semi-finished steel, Western mills have set out to increase their plate mill bookings and thereby to check, in some measure, the flow of orders to Eastern mills.

It is worthy of note that sales of rails and semi-finished steel were almost wholly lacking in the past week, while for the third consecutive seven-day period plate bookings have overshadowed new commitments in other steel products.

Producers' books are growing, while specifications hold steady at the current shipping rate, which is virtually equal to local mill capacity. The general market, while satisfactory throughout the summer, now seems to be growing even more active and thoughts of a possible slowing down before fall have passed from the minds of buyers and sellers.

Preliminary estimates indicate that steel ingot production for July has established a record for that month. Each of the seven months in 1929 has been a record for that particular month.

The local scrap market is in the hands of brokers, who are gaining confidence in the near future, as indicated by their willingness to take long positions. Railroad lists are being bid at higher prices and miscellaneous lots of the heavy-tonnage grades are quickly taken out of the market at steadily advancing prices.

Pig Iron.—Shipments of Northern iron will not establish a record for July, but the tonnage added to the total for the previous six months sets a record for any seven months' period. With one merchant stack out for relining, heavy drafts are being made against stocks in the hands of producers. In fact, it is thought by some that, had full pig iron producing capacity been available in July, shipments would have set a record. Six merchant furnaces are in blast, and it is probable that the Iroquois stack will be relined in time to be lighted by the middle of August. Stocks at furnaces are low, a situation which is unusual at the approach of the final quarter. New purchases are in moderate volume. A number of melters who are now buying third quarter iron are extending their contracts to cover the remainder of the year. Silvery releases are larger from users in western Michigan. Recently reduced prices, which lack strength, have failed to stimulate widespread buying. Stocks at charcoal iron furnaces, though smaller than in the late spring, are still of ample size to insure prompt delivery of most grades. The Southern iron market is quiet except for odd carlots placed in many cases as trial orders.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforc'g bars, billet steel	2.15c. to 2.35c.
Reinforc'g bars, rail steel	1.85c. to 1.95c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands (¾ in. in Nos. 10 and 12 gages)	3.20c.
Hoops (No. 14 gage and lighter)	3.75c.
Black sheets (No. 24)	4.05c.
Galv. sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.35c.
Spikes, ⅝ in. and larger	3.55c.
Track bolts	4.55c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, sq., tap. or blank	60
Hot-pressed nuts, hex., tap. or blank	60
No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	3.20
Cement c't'd nails, base per keg	3.20

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$20.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	20.50
Malleable, not over 2.25 sil.	20.00
High phosphorus	20.00
Lake Super. charcoal, sil. 1.50	27.04
So'th'n No. 2 fdy. (all rail)	$19.51 to 20.51
Low phos., sil. 1 to 2, copper free	29.50
Silvery, sil. 8 per cent	29.79
Bess. ferrosilicon, 14-15 per cent	46.29

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—New sales of spiegeleisen are light, and shipments against past obligations are smaller. Consumers of ferromanganese are ordering freely against old contracts.

Prices delivered Chicago: 80 per cent ferromanganese, $112.56; 50 per cent ferrosilicon, $83.50 to $88.50; spiegeleisen, 19 to 21 per cent, $40.76.

Plates.—For the second week, plate sales account for a large part of current orders to local mills, in fact, a larger share than last week, in view of a lack of rail and semi-finished purchases recently. Chicago plate mills are operating at capacity and new specifications, which are fully equal to shipments, assure heavy output for some time to come. Backlogs are unusually heavy, not only in proportion to local capacity, but also with respect to the season. Tank building programs continue to make headway, though no awards are reported. Fabricating shops are taking steel plates as fast as mills can make deliveries, which now range from six to eight weeks. New business in railroad equipment is light. The Great Northern is asking for prices on 300 underframes. In some quarters this is looked upon as a feeler, which may lead to the purchase of cars rather than underframes. Specifications from car shops are of moderate size, and shipments against past releases are large, while shops are pressing for quicker deliveries. Recent heavy sales of plates, largely for the manufacture of pipe, are interpreted by some as indicating a desire to hold more of this business for local mills. The drop in demand for automobile steels and a lessened rate of rail output is easing the problem of allotting steel to finishing departments. This permits greater production by plate mills.

Hot-Rolled Strip.—Specifications are fully equal to production, which is at local mill capacity. Prices are steady.

Structural Material.—Fabricators are looking to the future with greater confidence as the pending list grows and a more liberal number of small-tonnage contracts are placed. Although shop backlogs are not materially changed in size, enough work has been placed to keep unfilled business practically stationary, which is more than fabricators had expected in the midsummer weeks. Although official figures are not available, it is variously estimated that the Illinois Steel Co.'s expansion program will call for 40,000 to 50,000 tons of structural material. A Detroit fabricator is said to have taken 2000 tons for a branch plant of the Chevrolet Motor Car Co., and the Big Four railroad has ordered 2000 tons for a bridge at Terre Haute, Ind. Plans are being prepared for the Garrett Biblical Institute building at Chicago. Bids will be taken on the 6000 tons needed some time in the early fall. It is reported that legal obstacles are delaying the award of 3600 tons for the Thompson Building, Chicago.

Mill prices on plain material, per lb.: 2.05c. base, Chicago.

Bars.—Sales of bars are practically double those in the previous week, which were fully abreast of the average for the year. Specifications are equal to shipments, which are going forward at local mill capacity. Demand for mild steel bars is well diversified both as to character of specifications and as to consumers. Agricultural implement manufacturers are taking larger quantities now that inventories are out of the way. Forgers are taking heavier tonnages and cold-drawn steel producers, as well as bolt and nut makers, are taking liberal quantities. Prices for mild steel bars are steady at 2.05c. a lb., Chicago. Demand for alloy steel bars is steady from the majority of users, but consumption by automobile manufacturers is at low ebb, judged by releases to Chicago mills. In some cases, schedules that called for larger releases about Aug. 1 have been postponed to Aug. 15. This, however, is not taken as a reflection of the state of automobile

business, but rather as an indication that motor car manufacturers have not been able in all cases to get new models under way as rapidly as they had expected. Output of alloy steel bars in this district stands between 70 and 75 per cent of capacity. Spot buying is in moderate volume. Iron bar shipments and specifications are steady. Backlogs are light. The general situation in the rail steel bar market is unchanged from a week ago.

Wire Products.—Prices for nails throughout practically the whole of the Middle West show more weakness than a week ago. Demand from all classes of buyers is light. One disturbing factor, also affecting woven wire fencing, is the recent announcement by mail order houses that freight will be paid on all orders. Local sellers, already confronted with a weak and slow market, are intently watching this development without comment. Shipments of wire and wire products, as a whole, have gained in volume in the last few days and July now promises to be the best seventh month since 1922. Demand for concrete mesh is in good volume but below that of 12 months ago. Wire rope sales are large and shipments are heavy. Buyers are pressing for deliveries of electrical cable, which is sold up to November. General demand for electrical wire is active. Mill prices for wire and wire products are given on page 303.

Rails and Track Supplies.—New orders for standard-section rails total 1500 tons. Of unusual occurence in the light rail market are three orders that total 500 tons, the bulk of which will be shipped to Western copper producers. Rail output in this district is slowly tapering, the average now being about 72 per cent of capacity. New business in track fastenings is brisk, with 7000 tons in new orders. Inquiry is of little moment at present.

Prices f.o.b. mill, per gross ton: Standard section open-hearth and Bess. rails, $43; light rails, rolled from billets, $36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.15c.; angle bars, 2.75c.

Bolts, Nuts and Rivets.—Specifications are in good volume except on small rivets, the demand for which is measurably lighter. Spot sales are in moderate volume and prices are steady.

Reinforcing Bars.—Contracts for reinforcing bars are more numerous, but they are scattered over a wide territory. Competition remains keen and current prices are weak. Rail steel reinforcing bars ordinarily bring 1.85c. to 1.95c. a lb. and the billet steel commodity is commonly quoted at 2.15c. to 2.35c. a lb. out of Chicago warehouses. From some viewpoints the future looks bright. The pending list is large and during the week several general contracts have been placed, pointing to early awards for reinforcing bars. Small-tonnage awards are more numerous and odd lots of small size are frequently coming out for figures. New contracts and fresh inquiries are shown on page 318.

Cast Iron Pipe.—Glamorgan Pipe & Foundry Co. has been awarded 1670 tons of 3 to 12-in. Class B pipe by Chicago at $46.05 a ton, delivered, or $37.85 a ton, Birmingham. Aberdeen, S. D., is said to have placed 12,000 ft. of 8-in., 14,000 ft. of 10-in. and 10,000 ft. of 12-in. pipe with the United States Pipe & Foundry Co. The McWane Cast Iron Pipe Co. has been awarded 18,000 ft. of 6 and 8-in. pipe by Clio, Mich. Hamilton County, Ohio, will take bids Aug. 2 on 43,000 ft. each of 6 and 8-in. pipe, 3800 ft. of 12-in. and 34 tons of fittings. Public utilities are buying occasional carloads and railroads are finding use for small quantities of cast pipe. Deliveries are prompt on practically all sizes.

Prices per net ton, del'd Chicago: Water pipe, 6-in. and over, $45.20 to $46.20; 4-in., $49.20 to $50.20; Class A and gas pipe, $3 extra.

Sheets.—Specifications are in larger volume than shipments, which have been cut to 80 per cent of hot mill capacity. Curtailment of production is due to hot weather during the last five or six days. New buying is steady and in good volume, and prices for sheets are firm except when delivery is made to the Southwest. Jobbers continue to order freely and light tank makers are busier, as indicated by larger specifications to hot mills.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 3.10c.; No. 24 galv., 3.85c.; No. 10 blue ann'l'd, 2.35c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

Cold-Rolled Strip. — Operations have been cut to a range of 70 to 75 per cent of capacity, following a decline in specifications. New buying is light, with prices steady.

Coke. — Shipments of by-product foundry coke are at local oven capacity. New buying is confined to small lots. Prices are steady at $8 a ton, local ovens.

Old Material.—Dealers are bidding up railroad lists in an attempt to take a long position in the market. Expiration of several large commitments in the local market, steadiness of demand from large consumers and an upward movement in the Pittsburgh market all tend to confirm brokers' belief that there is strength underlying the local market and that prices will go up rather than down. In the meantime quotations remain at a dead level, with undercurrents of strength shown in some grades that were notably weak at the middle of the month. Steel mills discount the argument of sellers of scrap that the pressure placed on blast furnaces will soon necessitate heavy repairs, with resultant increase in the use of cold metal and larger quantities of scrap. Shipments of borings barely meet the needs of local consumers, as increasing tonnages are being moved from Michigan to Eastern markets. Brokers are bidding as high as $15.75 a gross ton, delivered, for odd carloads of heavy melting steel. The Chicago & North Western has offered 1500 tons, and the Baltimore & Ohio will sell 15,000 tons on Aug. 5.

Prices deliv'd Chicago district consumers:

Per Gross Ton	
Basic Open-Hearth Grades:	
Heavy melting steel	$14.75 to $15.25
Shoveling steel	14.75 to 15.25
Frogs, switches and guards, cut apart, and misc. rails	16.50 to 17.00
Hydraul. compressed sheets	13.00 to 13.50
Drop forge flashings	10.50 to 11.00
No. 1 busheling	13.00 to 13.50
Forg'd cast and r'l'd steel carwheels	18.50 to 19.00
Railroad tires, charg. box size	18.50 to 19.00
Railroad leaf springs cut apart	18.50 to 19.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	16.75 to 17.25
Coil springs	19.00 to 19.50
Electric Furnace Grades:	
Axle turnings	14.50 to 15.00
Low phos. punchings	16.50 to 17.00
Low phos. plates, 12 in. and under	16.50 to 17.00
Blast Furnace Grades:	
Axle turnings	10.75 to 11.25
Cast iron borings	9.75 to 10.25
Short shoveling turnings	9.75 to 10.25
Machine shop turnings	7.00 to 7.50
Rolling Mill Grades:	
Iron rails	16.00 to 16.50
Rerolling rails	17.50 to 18.00
Cupola Grades:	
Steel rails less than 3 ft.	17.75 to 18.25
Steel rails less than 2 ft.	18.25 to 18.75
Angle bars, steel	17.00 to 17.50
Cast iron carwheels	14.00 to 14.50
Malleable Grades:	
Railroad	16.75 to 17.25
Agricultural	15.50 to 16.00
Miscellaneous:	
*Relaying rails, 56 to 60 lb.	23.00 to 25.00
*Relaying rails, 65 lb. and heav.	26.00 to 31.00
Per Net Ton	
Rolling Mill Grades:	
Iron angle and splice bars	15.00 to 15.50
Iron arch bars and transoms	21.00 to 21.50
Iron car axles	26.00 to 26.50
Steel car axles	16.50 to 17.00
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	13.00 to 13.50
No. 1 busheling	9.00 to 9.50
No. 2 busheling	7.00 to 7.50
Locomotive tires, smooth	14.50 to 15.00
Pipes and flues	10.00 to 10.50
Cupola Grades:	
No. 1 machinery cast	14.50 to 15.00
No. 1 railroad cast	13.75 to 14.25
No. 1 agricultural cast	13.25 to 13.75
Stove plates	12.25 to 12.75
Grate bars	11.75 to 12.25
Brake shoes	10.50 to 11.00

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

U. S. Aluminum Expansion

United States Aluminum Co., New Kensington, Pa., will erect a new machine shop, rehabilitate old New Kensington Brewing Co. property and build an addition to Arnold tube mill at total cost of $1,000,000. Machine shop will be of brick and steel construction, 130 x 482 ft., with 50-ton cranes on working floor and with light tool equipment on mezzanine floor. The brewing company brick buildings will be improved for storage of patterns and materials for adjoining machine shop. Tube mill addition will be 155 x 425 ft., and will house tube drawing and heat treating equipment with inspection and packing facilities.

New York

Pig Iron Sales of 10,000 Tons—Structural Steel Activity Sustained—Weakness in Sheets

NEW YORK, July 30.—Pig iron sales during the week totaled 10,000 tons, and pending business aggregates 20,000 tons. The largest inquiry, 10,000 tons for American Radiator Co. plants in the West, is still open. A Connecticut melter is in the market for 5000 tons and a New England textile manufacturer wants 1000 tons. The Thatcher Co., Newark, N. J., is inquiring for 500 tons of foundry iron for the current quarter. The Eastern Malleable Iron Co., Naugatuck, Conn., recently closed against an inquiry for 1000 to 2000 tons, and is in the market for additional tonnage. Foundry melt is spotty in some areas, but on the whole, if one is to judge from pig iron shipments, is well sustained. Hot weather, of course, has tended to slow up operations to some extent. Outside of a sale of 1000 tons of Alabama iron to a New England consumer, orders for Southern iron have been confined to scattered small lots. Representatives of Southern producers, however, are active in covering this market and in developing ways of delivering iron on the most economical basis. The water-and-rail rate from Birmingham to Savannah, Ga., and via steamship to New York, amounting to $5.50 a ton, with free lighterage at this end, is being ignored for the time being because of the possibility of its suspension. The rate of $3.50 a ton to Norfolk, Va., on iron for transshipment by barge northward has not been protested. The handling charge at Norfolk is 35c. a ton and barge rates to New York range from $1.10 to $1.20 a ton (1000 tons or more). If loaded from barge on Pennsylvania Railroad cars for further shipment, handling costs of 15c. a ton or less are waived. Effective Aug. 1 a railroad rate of $1.01 a ton to local New Jersey points will be available from Jersey City. As a consequence the total transportation charges from Birmingham to these New Jersey points will be $5.96 a ton, or a delivered price on foundry grade at $14.50. Birmingham, of $20.46. The main difficulty is arranging for barge shipments of 1000 tons or more from Norfolk. New York State furnaces are well booked and have no excessive stocks. No sales at less than $17.50, Buffalo, have been reported, and a considerable tonnage, made up largely of smaller lots, has been sold at $18, base.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$22.41 to $22.91
*Buf. No. 2, del'd east. N. J.	20.78 to 21.28
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	20.89 to 22.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	21.39 to 22.52

Freight rates: $4.91 from Buffalo, $1.39 to $2.12 from eastern Pennsylvania.

*Price delivered to New Jersey cities having rate of $3.28 a ton from Buffalo.

Warehouse Business.—Buying from stock is restricted to small lots, but there is still a fair tonnage of structural material moving and a moderate volume of business in sheets is reported. Black and galvanized sheet prices are subject to shading of $1 to $2 a ton and even greater concessions are occasionally made on substantial orders for blue annealed. Softness of blue annealed sheet prices is attributed to the wide spread between present warehouse and mill quotations, which, on the basis of 2.20c., base Pittsburgh, or 2.54c., delivered New York, from the mill, is about $27 a ton.

Cast Iron Pipe.—The usual season of quiet in pressure pipe buying has set in and not much activity is expected until inquiry begins to appear for fall delivery of pipe. A substantial number of orders are being placed for carload lots, but about the largest recent award in this district was 625 tons of 8-in. Class C pipe for Yonkers, N. Y., on which the low bid was $35.70 per net ton, delivered, quoted by the United States Pipe & Foundry Co. The freight rate from Burlington to Yonkers is $3.80 per ton. On 27 tons of 6-in. Class B pipe for Newburgh, N. Y., R. D. Wood & Co. were the low bidders with a price of $34.64 per ton and a $2.90 per ton freight rate from Florence, N. J.

Prices per net ton deliv'd New York: Water pipe, 6-in. and larger, $33.60 to $34.60; 4-in. and 5-in., $36.60 to $37.60; 3-in., $43.60 to $44.60. Class A and gas pipe, $3 extra.

Reinforcing Bars.—Numerous small orders, which have totaled a fairly good volume in the aggregate, have been placed. Prices have not changed.

Billet steel reinforcing bars in 40, 50 and 60-ft. lengths, 2.05c. per lb., Pittsburgh, and 2.30c. per lb., Pittsburgh warehouse, for cut lengths. Out of New York warehouse, 2.90c. per lb. for lots of 5 tons or more, 3.05c. for lots of 2 to 5 tons and 3.30c. for less than 2 tons, all delivered at job.

Finished Steel.—Despite a slight slackening in demand for bars and plates, business continues unusually good for midsummer. An important producer says that bookings in July were about 25 per cent ahead of those in the same month of 1928. Orders and specifications have come from a wide range of consumers. Prices are firm and show no change. Pronounced activity in structural steel is still a feature. Lettings in the past week have included 3000 tons for a Chevrolet assembly plant at Tarrytown, N. Y., 2200 tons for the new building of the Pratt & Whitney Aircraft Corporation at East Hartford, Conn., and 3800 tons for an office building in Newark, N. J. Two thousand tons for a plant addition to the Atwater Kent factory in Philadelphia was the largest of the fresh inquiries. Pending business is heavy and awards in the next month are expected to insure fairly good operations for district fabricating shops. The placing of 14,000 tons for a bridge across the Hackensack River by the Pennsylvania Railroad is expected in a few days. The Phœnix Bridge Co. is low bidder. The

Warehouse Prices, f.o.b New York

	Base per Lb.
Plates and structural shapes	3.30c.
Soft steel bars, small shapes	3.25c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Cold-roll. strip, soft and quarter hard	5.15c. to 5.40c.
Hoops	4.25c.
Bands	3.75c.
Blue ann'l'd sheets (No. 10)	3.85c. to 3.90c.
Long terne sheets (No. 24)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases,	4.50c. to 7.00c.

	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller	60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	60
1 x 6 in. and smaller	50 to 50 and 10

Boiler Tubes—	Per 100 Ft.
Lap welded, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

	Black	Galv.
Standard Steel—		
⅛-in. butt	46	29
¼-in. butt	51	37
1-3-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
⅛-in. butt	5	+19
¼-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per Box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	3.80c.
No. 22	3.95c.
No. 24	4.00c.
No. 26	4.10c.
No. 28*	4.25c.
No. 30	4.50c.

Sheets, Galvanized

	Per Lb.
No. 14	4.40c.
No. 16	4.25c.
No. 18	4.40c.
No. 20	4.50c.
No. 22	4.60c.
No. 24	4.75c.
No. 26	5.00c.
No. 28*	5.25c.
No. 30	5.65c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

contract for 2550 tons for pier 3, North River, should be awarded this week. Aug. 2 is the date set for opening bids for 13,200 tons for a section of the New York subway in Queens. Sheet steel manufacturers comment on the rather incongruous situation in the sheet market. Although sales have been exceptionally good and most mills are unable to make deliveries in less than four to six weeks—factors which should give strength to the market—prices have sagged somewhat, especially in galvanized and black sheets. The former grade is selling at 3.60c., Pittsburgh, to consumers and 3.50c. to jobbers, with an occasional dip to the latter figure on an order for a consumer. Even lower quotations are said to rule in the South on roofing and siding material.

Mill prices per lb., deliv'd New York: Soft steel bars, 2.29c.; plates, 2.22½c.; structural shapes, 2.19½c.; bar iron, 2.14c.

Coke.—Demand for foundry coke is fair. Standard furnace coke is moderately active and quotations are unchanged at $2.75 to $2.85 per net ton, Connellsville. Special brands of beehive foundry coke are $4.85 per net ton, ovens, or $8.56 per net ton, delivered to northern New Jersey, Jersey City and Newark and $9.44 to New York or Brooklyn. By-product coke is quoted at $9 to $9.40 a net ton, Newark or Jersey City, and $10.06, New York or Brooklyn.

Old Material.—Heavy melting steel prices paid by brokers for delivery to eastern Pennsylvania and occasionally for shipment to the Pittsburgh district continue firm, with a slight tendency to advance. Other grades of scrap are inactive and prices are unchanged. No. 1 heavy melting steel is quoted by brokers at $16.25 to $16.50 per ton, delivered eastern Pennsylvania, and brokers buying for shipment to western Pennsylvania are offering $18.25 per ton, delivered, or $12.95 per ton, New York. Rerolling rails are being bought at $17.50 per ton, delivered to eastern Pennsylvania, and cast iron carwheels are stronger by about 50c. a ton. Cast scrap is quiet.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel	$12.75 to $13.35
Heavy melting steel (yard)	8.00 to 9.75
No. 1 hvy. breakable cast.	10.75 to 11.75
Stove plate (steel works).	8.00 to 8.25
Locomotive grate bars....	8.25 to 8.75
Machine shop turnings....	7.50 to 7.75
Short shoveling turnings..	7.50 to 7.75
Cast borings (blast furn. or steel works).....	7.00 to 7.25
Mixed borings and turnings	6.75 to 7.25
Steel car axles.....	19.50 to 20.00
Iron car axles.....	24.00 to 25.00
Iron and steel pipe (1 in. dia., not under 2 ft. long)	10.75
Forge fire	9.75 to 10.25
No. 1 railroad wrought...	12.00 to 12.50
No. 1 yard wrought, long..	11.00 to 11.50
Rails for rolling.....	13.25 to 13.75
Cast iron carwhee's.....	12.50 to 13.00
Stove plate (foundry)....	8.00 to 8.50
Malleable cast (railroad).	14.00 to 14.50
Cast borings (chemical)..	10.00 to 10.50

Prices per gross ton, deliv'd local foundries:

No. 1 machry. cast.....	$17.00
No. 1 hvy. cast (columns, bldg. materials, etc.), cupola size.....	15.00
No. 2 cast (radiators, cast boilers, etc.)	14.50

Cleveland

August Outlook Is for July Rate, a Midsummer Record—Upturn in Sheet Orders

CLEVELAND, July 30.—Steel production in this district shows no decline, except such as had been occasioned by extreme heat. Measured by output, the month has established a new record for midsummer, not excepting the war years and the unusual summer activity of 1920.

Incoming business, as compared with June, has shown some falling off, but the decline has been less than was expected. The effect of the reduced scale of new buying and shipping releases has been to lower the tonnage of unfilled orders on mill books, but mill operations have been held at a high rate. On the basis of orders now definitely scheduled, it appears certain that mill output in August will be continued at about the current rate.

Except in some widths and gages of sheet and strip steel, mills are not in need of orders, and even in these products the need is not urgent. A few mills are competing more aggressively for business in galvanized sheets, and the continuous sheet mills have given concessions on the gages and widths they roll. Generally, however, the price situation is fairly steady.

The only marked change in the past week was an upturn in sheet orders. Whether buyers had been holding off in the expectation of lower prices or for some other reason, the fact is many of them were forced to come into the market. Last week's sheet orders with some mill offices were larger than the total tonnage for the preceding three weeks of the month.

Automobile demand is somewhat spotty, but on the whole is still good. A few plants which were shut down or had curtailed output because of vacations or changes in models are again in production, although at a moderated pace. The Chevrolet Motor Car Co. has cut its schedules, but the general trend among other companies is upward as compared with the early part of July. Shipping schedules for steel that have been arranged for August and September by automobile manufacturers and body builders generally call for more steel than has been shipped to these companies during July.

Pig Iron.—Pig iron business showed further improvement, with sales totaling about 25,000 tons, which was 5000 tons more than was sold in the previous week. Inquiry, however, is very light, but Lake furnaces are well sold up through this quarter. Melters are not yet taking much interest in their fourth quarter requirements. Shipments are running only slightly less than in June. A steel company that sells merchant iron is using nearly all of its product in its own open-hearth furnaces and is virtually out of the market for the remainder of this quarter. An Indiana company that was in the market for 5000 tons of foundry iron is understood to have closed. Prices are steady at $18.50, Cleveland, for outside shipment, at $19 for local delivery and at $20, Lake furnace, for Michigan delivery.

Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25	$19.50
S'th'n fdy., 1.75 to 2.25....$20.00 to	20.50
Malleable	19.50
Ohio silvery, 8 per cent...	28.00
Basic Valley furnace.....	18.50
Stand. low phos., Valley.. 26.50 to	27.00

Prices except on basic and low phosphorus are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Warehouse Business. — Although July is usually a dull month in jobbers' sales, this month has been an exception. Business has been in smaller volume than in June, but has outstripped all sales records for July. The decline from June has not been severe. Prices are well maintained.

Reinforcing Bars.—Inquiry is light. The largest contract was 500 tons for the Cleveland Electric Illuminating Co. at Ashtabula, Ohio, taken by the Bourne-Fuller Co.

Semi-Finished Steel.—While the production of semi-finished steel now seems to be ample for all requirements, there is no surplus, and the furnaces and mills of the local producer are being operated at full capacity to take care of contract business. The price remains at $35, Cleveland, Youngstown or Pittsburgh, for billets, slabs and sheet bars.

Bolts, Nuts and Rivets.—Orders for bolts and nuts have increased during the past few days. Total bookings for July will be larger than those of June. Demand for rivets has not improved and falls considerably short of makers' capacity.

Plates, Shapes and Bars. — New business and contract specifications for plates, shapes and bars during July have reached a volume closely approximating that of June. While the structural steel market is quiet at the moment, considerable new

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and struc. shapes.....	3.00c.
Soft steel bars.....	3.00c.
Reinforc. steel bars.....2.25c. to	2.50c.
Cold-fin. rounds and hex.....	3.65c.
Cold-fin. flats and sq.....	4.15c.
Hoops and bands, No. 12 to ⅞ in., inclusive	3.25c.
Hoops and bands, No. 13 and lighter	3.65c.
Cold-finished strip .....*5.95c.	
Black sheets (No. 24).....3.70c. to	3.90c.
Galvanized sheets (No. 24).4.60c. to	4.75c.
Blue ann'l'd sheets (No. 10).....	3.25c.
No. 9 ann'l'd wire, per 100 lb.....	$2.95
No. 9 gal. wire, per 100 lb.....	3.40
Com. wire nails, base per keg.....	2.95

*Net base, including boxing and cutting to length.

work is in prospect. Meanwhile, fabricating shops are busy on contracts and are calling for steady shipments of plain material. Plate demand in this district is sustained by the continued activity of boiler and tank fabricating shops. The Cleveland producers of steel bars are taking a good deal of the local tonnage. Outside mills are not competing strongly for this business, especially on the larger tonnages, which occasionally bring out price concessions when considered on a delivered basis.

Old Material.—Despite the strength at Pittsburgh and Youngstown, the local scrap market continues quiet, with prices unchanged. Local mills are not buying and, in fact, have not yet taken in all of the material due them on contracts. At Youngstown, $18.50 is being paid for heavy melting steel and $18 for hydraulic compressed bundles. Production of scrap by Detroit automobile plants has declined this month.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$15.00 to $15.50
No. 2 heavy melting steel	14.50 to 15.00
Compressed sheet steel	14.50 to 15.00
Light bundled sheet stampings	12.00 to 12.50
Drop forge flashings	13.00 to 13.25
Machine shop turnings	9.25 to 9.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	16.00 to 16.50
No. 1 busheling	13.25 to 13.75
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades:	
Low phos., forging crops	17.75 to 18.00
Low phos., billet, bloom and slab crops	18.50 to 18.75
Low phos., sheet bar crops	18.00 to 18.50
Low phos., plate scrap	18.00 to 18.50
Blast Furnace Grades:	
Cast iron borings	10.75 to 11.00
Mixed borings and short turnings	10.75 to 11.00
No. 2 busheling	10.75 to 11.00
Cupola Grades:	
No. 1 cast	16.75 to 17.25
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft.	18.50 to 19.00
Miscellaneous:	
Railroad malleable	18.00 to 18.50
Rails for rolling	16.25 to 16.50

Sheets.—Demand took a spurt in the past week. Some local sales offices received a larger tonnage of orders last week than in all of the rest of July. In some instances, automobile companies and body builders have arranged steel shipping schedules for August and September that call for larger tonnages than were shipped in July. The price situation reflects continued weakness in galvanized sheets, on which 3.50c., Pittsburgh, which has been the price to jobbers, has been extended in certain cases to consumers. Black sheets remain at 2.85c., Pittsburgh. Light gage blue annealed material, especially in the wider sizes, continues fairly firm in price, but the heavy gage narrow material, such as is rolled by the continuous mills, is being sold at concessions. Some sheet mills still have substantial backlogs. Deliveries of nearly all grades have shortened, but rollings sufficient for three or four weeks are in hand in many grades. On some grades, orders extend into September.

Strip Steel.—While there has been a let-down in the call for strip steel, the mill situation is still fairly good. No marked curtailment of production is reported in hot-rolled strip. Some makers of cold-rolled strip are in need of orders, while others have a fair volume ahead of them. The easing has occurred chiefly in wide strips, which can be had in one to two weeks.

Wire Products. — Manufacturers' wire is being shipped in good volume. While the automobile industry is not taking as much as it was a month or two ago, the shipments to that industry are regarded by the mills as highly satisfactory for this time of year. Plain wire prices are steady, but irregularities persist in wire nail prices.

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.70c.
Plates, ⅜-in.	2.90c.
Structural shapes	2.70c.
Soft steel bars, small shapes, iron bars (except bands)	2.80c.
Round-edge iron	3.50c.
Round-edge steel, iron finished 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforc. steel bars, sq. twisted and deform.	2.60c. to 2.80c.
Cold-fin. steel, rounds and hex.	3.60c.
Cold-fin. steel, sq. and flats	4.10c.
Steel hoops	3.55c.
Steel bands, No. 12 to ⅜-in. inclus.	3.30c.
Spring steel	5.00c.
*Black sheets (No. 24)	4.10c.
†Galvanized sheets (No. 24)	4.85c.
Light plates, blue annealed (No. 10)	3.25c
Blue ann'l'd sheets (No. 13)	3.40c.
Diam. pat. floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

Philadelphia

Steel Specifications Smaller — Pig Iron Prices Begin to Be Affected By Southern Competition

PHILADELPHIA, July 30.—Operating rates of steel mills are being maintained, but specifications against current contracts are smaller and backlogs on mill books have declined from the total a month ago. Prices are firm on plates, shapes and bars and a firmer tone is evident on black and galvanized sheets, since the recent recession of about $2 a ton in quotations.

Pig iron is lacking in strengtn in the face of competition from Southern sellers, but concessions have not been large. With the exception of heavy melting steel, iron and steel scrap is quiet and prices show no tendency to advance.

Reinforcing Bars.—Projects calling for small tonnages of bars are numerous, but competition is keen among distributers, so that 1.95c. per lb., Pittsburgh, or 2.27c., delivered Philadelphia, with no extra for cutting to length is still obtainable on billet steel bars. An outstanding inquiry is for 700 tons of reinforcing bars in a build- for the Atwater Kent Mfg. Co., Philadelphia. Billet steel bars are quoted at 1.95c. to 2.05c., Pittsburgh, or 2.27c. to 2.37c., delivered Philadelphia, with the $5 extra for cutting to length sometimes disregarded by sellers. Rail steel reinforcing bars are quoted at 1.95c., Franklin, Pa., or Tonawanda, N. Y., or 2.27c., delivered Philadelphia, with no extra for cutting to length.

Pig Iron.—Southern basic iron is being quoted openly at $13.50 per ton, furnace, but recent bids for eastern Pennsylvania business have been at $13 a ton and less. Consequently, with consumers in this district considering the purchase of Birmingham basic iron, the eastern Pennsylvania market is lacking in strength and $20 to $20.50 per ton, delivered, is representative of the current trend. Foundry iron prices have been shaded by sellers of Southern iron from $14.50 per ton, Birmingham furnace, and in the past week a consumer in this district has closed on 1000 tons of Southern iron. While eastern Pennsylvania furnaces are not inclined to meet the delivered prices of Southern iron, they recognize that the saving to the buyer must be reduced to a minimum, which has resulted in shading $21.50, furnace, by 50c. to $1 a ton. Except for an inquiry from the Sun Shipbuilding Co., Chester, Pa., for about 500 tons of No. 2 and No. 2X foundry iron, current inquiry is for small lots.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	$21.26 to $22.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.76 to 22.76
East. Pa. No. 1X	22.26 to 23.26
Basic (del'd east. Pa.)	20.00 to 20.50
Gray forge	20.50 to 21.00
Malleable	21.25 to 21.75
Stand. low phos. (f.o.b. N. Y. State furnace)	22.00 to 23.00
Cop. b'r'g low phos. (f.o.b. furnace)	23.50 to 24.00
Va. No. 2 plain, 1.75 to 2.25 sil.	24.04
Va. No. 2X, 2.25 to 2.75 sil.	24.54

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Bars.—Deliveries are shorter, ranging from two to three weeks, but operating rates of mills are well maintained with sufficient tonnage on the books to carry producers over the period of mid-summer quiet. Prices are firm at 1.95c. per lb., Pittsburgh, or 2.27c., delivered Philadelphia.

Shapes.—Fabricators are well engaged with contracts and not inclined to quote so low for new business as has been the case in the past. Shape mills are maintaining a good rate of operation, but prices although firmer, show no tendency to advance from

1.95c. to 2.05c., f.o.b. nearest mill to consumer, or 2.01c. to 2.11c., delivered Philadelphia.

Plates.—The volume of specifications against contracts is smaller, but this is generally considered as a temporary condition of business, attributable to the summer. Deliveries still range from two to three weeks and prices are firm at 2.05c., per lb., Coatesville, or 2.15c., delivered Philadelphia.

Sheets.—Black and galvanized sheets have settled to 2.85c., Pittsburgh, or 3.17c., delivered Philadelphia for black and 3.60c., Pittsburgh, or 3.92c., Philadelphia, for galvanized. Occasionally concessions of $1 a ton are made from these prices on sizable tonnages. Blue annealed sheets are being maintained at 2.35c. per lb., Pittsburgh, or 2.67c., delivered Philadelphia for No. 13 gage, and light plates blue annealed are quoted at 2.20c., Pittsburgh, or 2.52c., delivered Philadelphia for No. 10 gage.

Imports.—In the week ended July 27, a total of 970 tons of chrome ore arrived at this port from Greece and 1060 tons of pig iron was received, of which 979 tons was from British India and 81 tons from Sweden. Steel imports consisted of 52 tons of steel bands from Belgium and 20 tons from the United Kingdom and 92 tons of steel billets from Sweden.

Old Material.—A Pencoyd, Pa., mill has closed on a small tonnage of No. 2 automobile scrap at $14.50 per ton, delivered, an advance of 25c. from its previous buying price. No. 1 heavy melting steel is firm at $16.50 to $17 per ton, delivered, but other grades are inactive and prices lacking in strength, especially cast scrap.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$16.50 to	$17.00
Scrap T rails		16.00
No. 2 heavy melting steel	12.50 to	14.50
No. 1 railroad wrought	16.00 to	16.50
Bundled sheets (for steel works)		11.50
Hydraulic compressed, new	14.50 to	15.00
Hydraulic compressed, old	12.00 to	12.50
Machine shop turnings (for steel works)	11.50 to	12.00
Heavy axle turnings (or equiv.)	14.00 to	14.50
Cast borings (for steel works and roll. mill)	11.00 to	11.50
Heavy breakable cast (for steel works)	15.00 to	15.25
Railroad grate bars	12.00 to	12.50
Stove plate (for steel works)	12.00 to	12.50
No. 1 low phos., hvy., 0.04% and under	22.00 to	23.00
Couplers and knuckles	19.50 to	20.50
Rolled steel wheels	19.50 to	20.50
No. 1 blast f'nace scrap	10.50 to	11.00
Wrot. iron and soft steel pipes and tubes (new specific.)		15.00
Shafting	19.00 to	19.50
Steel axles	23.00 to	23.50
No. 1 forge fire		14.00
Cast iron carwheels	16.50 to	17.00
No. 1 cast	16.50 to	17.00
Cast borings (for chem. plant)		14.50
Steel rails for rolling	16.50 to	17.00

To Assist on Census of Manufactures

WASHINGTON, July 30.—Revision of inquiries on the general schedule of the manufactures' census will be prime purpose of an executive committee named at a meeting last Friday at the Department of Commerce of the Advisory Committee for the Census of Manufactures. There also was appointed a publicity committee, which will institute a campaign to acquaint business men with the scope and importance of the statistics with the hope of obtaining complete cooperation in getting necessary data.

The executive committee, approved by Secretary of Commerce Lamont, includes the following: Col. L. S. Horner, president, Niles-Bement-Pond Co., New York, chairman, and Walter S. Tower, Bethlehem Steel Co..

National Machine Tool Show in Cleveland

The most complete range of machine tools, equipment and accessories ever assembled, it is stated by its management staff, will be on display in the 1929 National Machine Tool Builders' Exposition, which will occupy the West Annex, Arena and Arcade of the Public Auditorium in Cleveland, from Sept. 30 to Oct 4 inclusive.

The exposition will be visited, according to official forecast, by some 15,000 executives, engineers, production specialists, buyers, superintendents, shop foremen and operating men from among the diversified machine tool using industries in this country and abroad.

In direct charge of the 1929 exposition is the following committee: Chairman: J. Wallace Carrel, Lodge & Shipley Machine Tool Co.; P. E. Bliss, Warner & Swasey Co.; Ralph E. Flanders, Jones & Lamson Machine Co.; Robert M. Gaylord, Ingersoll Milling Machine Co.; James E. Gleason, Gleason Works; and ex-officio Henry Buker, Brown & Sharpe Mfg. Co., president of the association.

What the Railroads Did in 1928

"Statistics of Common Carriers," issued by the Interstate Commerce Commission in pamphlet form, shows that the railroads in 1928 transported 2,361,622,636 net tons of revenue freight an average distance of 183.31 miles. During the same year 790,327,447 passengers were carried an average of 39.99 miles each. The freight earned a revenue averaging 1.081c. for each ton-mile. The passengers produced a revenue of 2.85c. average for each passenger-mile.

Investment of the railroads in lines, plant and equipment is given as $24,873,474,285, an increase of 1.7 per cent over the preceding year. Use of this property produced total revenues aggregating $6,111,735,511. Against this the operating expenses amounted to $4,427,995,036, giving an operating ratio of 72½ per cent. Taxes amounted to $389,432,415 and dividends to $431,030,910. The dividends were at the rate of 7.09 per cent on the stocks on which they were declared, and of 5.03 per cent on the total stocks outstanding.

Steel Furniture Makers Adopt Trade Rules

WASHINGTON, July 30.—The Federal Trade Commission has issued new trade practice rules covering the steel office furniture industry. Manufacturers held a conference with the commission in Washington on April 13 and voted to adopt rules governing the conduct of the industry. The conference represented more than 80 per cent of the volume of business and 65 per cent of the number of companies in the industry.

Expands Capacity for Stainless Iron

The Duraloy Co. of Pittsburgh has recently installed a 1½-ton Moore Lectromelt Furnace at its plant at New Cumberland, W. Va. Extensive additions have also been made to the machine shop, thus facilitating the output of machined chromium alloy castings in greater quantities.

Steel Traffic to Hold Up

Iron and steel freight traffic in the third quarter will approximately equal that of the second and will show a gain of 8 per cent over the third quarter of 1928, according to an estimate by the iron and steel committee of the Atlantic States Shippers Advisory Board.

Passing upon a complaint by the Vulcan Mold & Iron Co., Latrobe, Pa., Examiner Lewis L. Prout in a report to the Interstate Commerce Commission, made public yesterday, held that the rate of $2.02 per ton of pig iron from Hubbard, Ohio, and certain other points in the Mahoning and Shenango valleys to Latrobe is not unreasonable. It was recommended that the complaint be dismissed.

A 44-page booklet has been issued by the New Jersey Zinc Co., 160 Front Street, New York, entitled "Rolled Zinc." It is fully illustrated and contains tables and other information concerning the various rolled zinc products made by that company.

Tractors are coming more and more into use in India, according to a report received by the Department of Commerce from Assistant Trade Commissioner R. C. Cockburn, Calcutta.

Pacific Coast

Bids Received on Seattle Pipe Line—Large Amount of Reinforcing Work Pending—Structural Awards Decline

SAN FRANCISCO, July 27 (*By Air Mail*).—Demand for steel products, especially structural shapes, has eased off and few large tonnages are up for figures or pending. The outstanding development of the week was the tabulation of bids on the 3700-ton riveted Cedar River pipe line at Seattle, Wash., which showed the Western Pipe & Steel Co. to be the low bidder. Cast iron pipe bookings were also heavy, Oakland and Pasadena, Cal., placing 2173 tons and 852 tons respectively. Prices are being well maintained and little shading is being indulged in.

Pig Iron.—Both sales and inquiries for foundry iron are limited to unimportant lots. Specialty plants, such as stove and sanitary ware manufacturers, are operating on fairly heavy schedules, but jobbing plants remain on restricted schedules. Quotations are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah fdy., sil. 2.75 to 3.25	25.00 to 26.00
**Indian fdy., sil. 2.75 to 3.25	25.00 to 26.00

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Bars.—Important reinforcing bar lettings of the week included 550 tons for the Vance Building, Seattle, placed with the Northwest Steel Rolling Mills; 300 tons for an office building in Santa Monica, Cal., and 208 tons for highway work in Alameda County, Cal., the latter two projects being placed with unnamed interests. At the present time pending business exceeds 3000 tons, the largest project calling for 1150 tons for the West Garfield Street bridge, Seattle, bids on which open next week. Los Angeles out-of-stock prices are firm at 2.30c. a lb. base, on lots of 250 tons and up, 2.40c. a lb., on carload quantities and 2.70 c., on smaller lots. San Francisco prices are $2 a ton lower. Movement of merchant bar material has not improved of late, sales and inquiries being confined to small tonnages composed of a wide range of sizes. Prices on this class of steel remain firm at $2.35c. a lb., c.i.f. Coast ports.

Plates.—The East Bay Municipal Utility District has placed 100 tons of 54-in. riveted pipe with an unnamed interest. The only other important letting of the week, which went to the Willamette Iron & Steel Co. called for 150 tons for a digester for the Rainier Pulp & Paper Co., Seattle. Bids opened last week on the Cedar River pipe line, Seattle, show the Western Pipe & Steel Co. as being low. An award is expected within the next few days. Prices appear firm at 2.35c. c.i.f. Pacific ports.

Shapes.—Structural lettings have fallen off. Only four awards of over 100 tons were reported. Poole & McGonigle secured 900 tons for an office building in Portland, Ore., the McClintic-Marshall Co. took 500 tons for a hotel in San Francisco and the Consolidated Steel Corporation booked 200 tons for a factory addition in Huntington Park, Cal. Pending business is the lightest in several months. New inquiries include 1500 tons for the Los Angeles Stock Exchange Building, bids on which will be called for in September. Bids were opened this week on 105 tons for a bridge over the Nehalem River in Oregon. No change has occurred in prices, 2.35c., c.i.f., being firm.

Cast Iron Pipe.—Important cast iron pipe awards include 2173 tons of 6 to 20-in. Class 150 and Class B pipe for the East Bay Municipal Utility District, Oakland, booked by the United States Pipe & Foundry Co. The Pacific States Cast Iron Pipe Co. took 75 tons of 4-in. Class 150 pipe and the United States Pipe & Foundry Co. booked 777 tons of 6 to 12-in. Class 150 and 24-in. Class B pipe for Pasadena, Cal. Griffith Co. secured 185 tons of 4 to 12-in. Class B pipe for the improvement of Broadway, Santa Monica, Cal. Pending business calls for less than 2500 tons, no new inquiries of importance having come up for figures.

Steel Pipe.—Movement of standard steel pipe is holding up well, but most orders call for relatively small lots, as distributers have well balanced stocks. No action has yet been taken by the Pacific Gas & Electric Co., San Francisco, on its inquiry for 2263 tons of 8⅝-in. O. D. gas pipe for installation in Monterey, Salinas and Gilroy, Cal. This company also contemplates the laying of a 16-in. line across the Carquinez Straits bridge to serve lower valley points.

Coke.—Sales and inquiries cover small lots for prompt shipment. English beehive coke is quoted at $16 to $17 a net ton, delivered incoming dock, while by-product coke is quoted at $12.50 to $13.50 a ton.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	3.15c.
Soft steel bars	3.15c.
Small angles, ⅞-in. and over	3.15c.
Small angles, under ⅞-in.	3.55c.
Small channels and tees, ¾-in. to 2¾-in.	3.75c.
Spring steel, ¼-in. and thicker	5.00c.
Black sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.80c.
Galv. sheets (No. 24)	5.30c.
Struct. rivets, ½-in. and larger	5.65c.
Com. wire nails, base per keg	$3.40
Cement c't'd nails, 100 lb. keg	3.40

Birmingham

More Pig Iron Inquiry from the East—Steel Bookings 10 Per Cent Smaller than a Month Ago

BIRMINGHAM, July 30.—Merchant producers of pig iron anticipate a heavy movement to Eastern points on the new rail and steamer rates which are scheduled to go into effect the last of this week. While these rates have been protested, so far they have not been suspended. Several round tonnages already have been booked for East Coast points and inquiries from that section in the last few days indicate considerable interest in Birmingham iron. A few trial orders have already been shipped. Sales in the district were a little better last week. Several orders for 3000 to 4000 tons were booked. Some of the larger users have covered their third-quarter requirements, while others are buying for immediate requirements only. The smaller consumers prefer to buy iron as it is needed. The base price of $14.50, Birmingham, for No. 2 foundry continues. Shipments are at about the same rate as throughout July. Seventeen blast furnaces remain active. Of this number nine are on foundry iron, seven on basic and one on recarburizing iron.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.	$14.50
No. 1 fdy., 2.25 to 2.75 sil.	15.00
Basic	14.50

Finished Steel.—New business is estimated to be around 10 per cent less than at this time last month, but it is considerably larger than 12 months ago. There has been a gradual decline in orders during the latter part of July, due to the usual summer lull, which in past years has arrived several weeks earlier. In view of their substantial backlogs the mills have not been forced to curtail operations and except in rails they are practically at capacity. Business in wire products has declined from the June rate, but the aggregate is considerably ahead of last year. Deliveries of finished steel, as a whole, are in about the same volume as in the past several weeks. Prices are steady and unchanged. None of the pending structural projects has been placed. The Gulf States Steel Co. is expected to award an important tonnage for new buildings at Alabama City this week. Lettings and fresh inquiries for reinforcing bars are not up to the average. Twenty-two open-hearth furnaces out of a total of 23 have been active throughout July.

Cast Iron Pipe.—Awards in the pressure pipe market are few and in small to medium tonnages. Several important municipal projects, financed

by recent bond issues, are being held up due to the unsatisfactory market for the securities. Inquiries indicate a fair tonnage in prospect, considering conditions. Private buying has been of little consequence for several weeks. Pending projects include about 20,000 ft. of 6 and 8-in. pipe for West Greenville, S. C., to be awarded July 30; about 4 miles of 8 to 12-in. for Hollywood, Fla., to be awarded Aug. 15; about 9 miles of 16 to 20-in. pipe for Griffin, Ga., to be awarded about Sept. 1, and a fair-sized project at Kenner, La. Shipments continue in good volume and some plants have made reductions in stocks during July. Quotations remain at $37 to $38 a net ton, Birmingham, for 6-in. and larger diameters.

Coke.—A steady movement of material on contracts is about the only activity in the foundry coke market. The number of active ovens in the district is unchanged, but output is reported to be less than in June. The base price remains $5 a net ton, Birmingham.

Old Material.—Light buying in steel grades continues, but outside of this the market is at a standstill. Prices are without change.

Prices per gross ton, deliv'd Birmingham dist. consumers' yards:

Heavy melting steel	$12.50
Scrap steel rails	12.50
Short shoveling turnings	9.00
Cast iron borings	9.00
Stove plate	$11.50 to 12.00
Steel axles	21.00
Iron axles	23.00
No. 1 railroad wrought	10.00 to 10.50
Rails for rolling	14.00 to 15.00
No. 1 cast	13.50
Tramcar wheels	13.00
Cast iron carwheels	12.50 to 13.00
Cast iron borings, chem.	13.50 to 14.00

Boston

Pig Iron Producers Advance Quotations—Marked Scarcity Gives Scrap Market Stronger Tone

BOSTON, July 30.—Buffalo furnaces with comfortable backlogs for third quarter delivery have advanced prices $1 a ton to $18.50, base furnace, while others are asking $18. Furnaces east of Buffalo have not changed prices, but intimate they will do so within the near future. Business in the past week was less active, but sales included 1000 tons of Buffalo and 500 tons of Southern iron to a Massachusetts machinery manufacturer, 1000 tons of malleable to a Connecticut foundry and smaller tonnages, the aggregate being about 5000 tons. A small tonnage of Indian iron was sold at $22.50 a ton on dock here, duty paid. A Worcester, Mass., foundry is in the market for 1000 tons of No. 2X and No. 1X, and a Massachusetts machinery builder for 1000 tons of low phosphorus iron.

Foundry iron prices per gross ton deliv'd to most New England points:

†Buffalo, sil. 1.75 to 2.25	$21.78 to $22.78
†Buffalo, sil. 2.25 to 2.75	22.28 to 23.28
*Buffalo, sil. 1.75 to 2.25	22.41 to 23.41
*Buffalo, sil. 2.25 to 2.75	22.91 to 23.91
East. Penn., sil. 1.75 to 2.25	23.65
East. Penn., sil. 2.25 to 2.75	24.15
Va., sil. 1.75 to 2.25	25.21
Va., sil. 2.25 to 2.75	25.71
Ala., sil. 1.75 to 2.25	21.41 to 23.27
Ala., sil. 2.25 to 2.75	21.91 to 23.77

Freight rates: $4.91 all rail from Buffalo, and $4.28 rail and water; $3.65 from eastern Pennsylvania; $5.21 all rail from Virginia; $6.91 to $8.77 from Alabama.

*All rail rate.

†Rail and water rate.

Coke.—The outstanding development of the week was the placing of an order for 82 ovens with the Koppers Co. by the New England Coal & Coke Co. The demand for foundry coke holds up well despite a slight letup in the melt of iron due to the excessive heat. Prices are still $11 a ton, delivered within a $3.10 freight rate zone.

Reinforcing Steel.—Aggregate sales of billet steel bars for the week were 600 tons, including 200 tons for a Harvard University dormitory to be supplied by J. C. Coleman & Sons Co. Sellers are holding firmly to 2.66½c. a lb., base, from stock. The market for rail steel bars is quiet at 2.26½c., base, delivered common Boston freight rate points.

Warehouse Business.—The usual summer letdown in the movement of iron and steel out of warehouses is noted, but business is running ahead of a year ago and prices are being maintained. Dealers in domestic wire nails are experiencing competition from German nails.

Cast Iron Pipe.—The Boston Consolidated Gas Co. has split 2000 tons of 6 to 24-in. pipe with two Northern foundries, and Westfield, Mass., has purchased 100 tons of 6 and 8-in. from the Warren Pipe & Foundry Co. West Hartford, Conn., has rejected bids for 3600 tons of 36 and 42-in. cast iron pipe and has purchased cement pipe from the Lock Joint Pipe Co. at $369,204.25. Hamden, Conn., will close bids Aug. 2 on 3000 ft. of 10-in. pipe.

Imports.—Imports of pig iron at this port so far this month amount to 548 tons, all from India. The Mystic Iron Works, Everett, Mass., so far this month, has unloaded 10,560 tons of Newfoundland and 5950 tons of Bona ores.

Old Material.—Quotations on forge flashings are a shade easier owing to a marked slowing up in demand, but prices for other kinds of scrap tend upward. Higher prices on steel scrap have failed to bring out much material. Dealers say that never before was steel scrap as scarce as it is today. No. 1 heavy melting steel is generally $12.50 to $12.75 a ton, on cars shipping point, with specially selected stock $13. Scrap T-rails are bringing practically as much as No. 1 steel, and dealers are scouring New England for abandoned trolley lines. The export market is inactive. It is expected, however, that a steamer will load 1500 tons here in the latter part of August for Danzig delivery.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$12.50 to $13.00
Scrap T rails	12.00 to 12.50
Scrap girder rails	11.00 to 11.50
No. 1 railroad wrought	11.00 to 11.50
No. 1 yard wrought	9.00 to 9.50
Machine shop turnings	6.60 to 7.10
Cast iron borings (steel works and rolling mill)	6.50 to 6.60
Bundled skeleton, long	9.50 to 10.50
Forge flashings	10.00 to 10.25
Blast furnace borings and turnings	6.00 to 6.25
Forge scrap	9.00 to 9.25
Shafting	14.00 to 14.25
Steel car axles	18.00 to 19.00
Wrought pipe 1 in. in diameter (over 2 ft. long)	9.75 to 10.00
Rails for rolling	12.50 to 13.00
Cast iron borings, chemical	10.00 to 10.25

Prices per gross ton deliv'd consumers' yards:

Textile cast	$14.50 to $15.00
No. 1 machinery cast	15.00 to 15.25
No. 2 machinery cast	13.00 to 13.25
Stove plate	11.00 to 11.50
Railroad malleable	18.50 to 19.00

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hex	*3.55c. to 5.55c.
Spares and flats	*4.05c. to 7.05c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.

	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

*Including quantity differentials.

Special attention has been paid to the drinking water problem of steel mills, foundries and similar institutions by the Frigidaire Corporation, Dayton, Ohio, in the development of five new series of electric water coolers. Realizing that workers in places where temperatures are high and much physical labor is done do not dare drink water that is too cold, Frigidaire engineers have brought out factory-type coolers that produce water at any temperature desired.

The Reliance Machinery Sales Co., 1407 Brighton Road, Pittsburgh, has been appointed distributer in the Pittsburgh district of back-geared, screw cutting lathes manufactured by South Bend Lathe Works, South Bend, Ind.

Canada

Short Wheat Crop May Affect Imports of Pig Iron from United States—Structural Demand Active

TORONTO, ONT., July 30.—Although there is little future buying of pig iron, a number of melters are showing interest in the market and spot demand is being maintained at a satisfactory level. Deliveries on contract and spot shipments are in good volume, with the current movement 15 to 20 per cent above that of a year ago. Some melters are complaining that prices are high, and action on a few large orders has been postponed. Shading is reported in some districts where desirable tonnages are in prospect, but the greater part of current business is being taken at quoted prices. Any adverse effect that the short wheat crop in the Canadian West may have on the iron and steel industry will be chiefly in imports, due to the fact that agricultural implement makers get practically their entire raw material requirements from United States producers.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$24.60
No. 2 fdy., sil. 1.75 to 2.25	24.10
Malleable	24.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	$26.00
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	24.50
Imported Iron, Montreal Warehouse	
Summerlee	$33.50
Carron	33.00

Structural Steel.—A more pronounced buying movement has developed in structural steel. The Dominion Bridge Co., Lachine, Que., has been awarded 6000 tons of steel for the new Aldred Building at Montreal. Orders for 100 to 500 tons have improved of late and at the present time a number of substantial tonnage contracts are pending.

Old Material.—Demand is holding at a good level in spite of the holiday listlessness of the market. While new business is spotty, total sales for the week were in good volume. Mills have again dropped out of the market, with the result that there is very little demand for heavy melting steel and turnings. Foundries, taking small individual tonnages, are buying at frequent intervals with the consequence that new business is making good headway as compared with a year ago. Prices are firm, but without change.

Dealers' buying prices:

	Per Gross Ton	
	Toronto	Montreal
Heavy melting steel	$10.00	$8.50
Rails, scrap	11.00	9.00
No. 1 wrought	10.00	12.00
Machine shop turnings	7.50	5.00
Boiler plate	7.50	6.00
Heavy axle turnings	8.00	7.50
Cast borings	7.50	5.00
Steel turnings	7.50	6.50
Wrought pipe	6.00	6.00
Steel axles	15.00	20.00
Axles, wrought iron	17.00	22.00
No. 1 machinery cast	....	17.00
Stove plate	....	13.00
Standard carwheels	....	16.00
Malleable	....	13.00
	Per Net Ton	
No. 1 mach'ry cast	$16.00	....
Stove plate	12.00	....
Standard carwheels	15.00	....
Malleable scrap	14.00	....

St. Louis

Scrap Prices Continue to Rise—Pig Iron Buying Light—Steel Specifications Improve

ST. LOUIS, July 30.—Sales of pig iron during the last week were very small, the St. Louis Gas & Coke Corporation disposing of 250 tons of malleable to one East Side melter and 50 tons of high silicon iron to a local jobbing foundry. The small volume of sales is ascribed to the uncertainty caused by recent recessions in the price of Southern iron, melters being fearful of placing orders except for immediate requirements lest there be further reductions. The local maker has made no change in its published quotations, although it is understood to be meeting the market in competitive territory. The melt in the district continues heavy, activities during the last 30 days having been at a considerably higher rate than the average for the same period in the last several years, according to the Federal Reserve Bank of St. Louis. The bank statement also says that jobbing foundries, particularly those specializing in railroad castings, report orders substantially larger than a year ago, and that sales of farm implements and stoves during the first half of the year were considerably larger than during the same period in 1928.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$20.00
Malleable, f.o.b. Granite City	20.50
N'th'n No. 2 fdy., deliv'd St. Louis	22.16
Southern No. 2 fdy., deliv'd	18.92
Northern malleable, deliv'd	22.16
Northern basic, deliv'd	22.16

Freight rates: 75c. (average) Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Finished Steel.—An improvement in specifications against contracts for plates, shapes, bars and sheets is reported by mills. The price situation on sheets of all kinds is said to be firm. Railroads have completed allocations of their third-quarter requirements in plates, shapes and bars and sheets. A total of 875 tons of structural steel business in three projects was reported by fabricators in the district. Generally the structural trade is quiet.

Old Material — Consumers have been pressing dealers for deliveries on contracts, with the result that dealers' prices have been increased in the hope of stimulating shipments from the country. Receipts in this market have been light, and there is said to be a heavy short interest on the part of dealers. Advances range from 25c. to $1 a ton. Railroad lists: New York Central, 14,500 tons of 80, 85 and 100-lb. relaying rails; Union Pacific, 2565 tons; Chicago, Milwaukee, St. Paul and Pacific, 118 carloads and 2000 tons steel rails; Big Four, 1900 tons; Missouri-Kansas-Texas, 500 tons; Missouri Pacific, 116 carloads; St. Louis-San Francisco, six carloads.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

No. 1 heavy melting or shoveling steel	$14.00 to $14.50
No. 2 heavy melting or shoveling steel	13.25 to 13.75
No. 1 locomotive tires	15.50 to 16.00
Miscel. stand.-sec. rails including frogs, switches and guards, cut apart	16.25 to 16.75
Railroad springs	18.50 to 19.00
Bundled sheets	9.50 to 10.00
No. 2 railroad wrought	14.00 to 14.50
No. 1 busheling	10.00 to 10.50
Cast iron borings and shoveling turnings	9.50 to 10.00
Iron rails	15.00 to 15.50
Rails for rolling	16.75 to 17.25
Machine shop turnings	8.50 to 9.00
Heavy turnings	10.00 to 10.50
Steel car axles	19.00 to 19.50
Iron car axles	27.50 to 28.00
Wrot. iron bars and trans.	22.00 to 22.50
No. 1 railroad wrought	13.00 to 13.50
Steel rails, less than 3 ft.	18.00 to 18.50
Steel angle bars	14.50 to 14.75
Cast iron carwheels	14.50 to 15.00
No. 1 machinery cast	15.00 to 15.50
Railroad malleable	15.50 to 16.00
No. 1 railroad cast	15.00 to 15.50
Stove plate	12.50 to 13.00
Agricult. malleable	15.00 to 15.50
Relay. rails, 60 lb. and under	20.50 to 23.50
Relay. rails, 70 lb. and over	26.50 to 29.00

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shaftings, screw stock	3.75c.
Black sheets (No. 24)	4.25c.
Galv. sheets (No. 24)	5.10c.
Blue ann'l'd sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	4.30c.
Galv. corrug. sheets	5.15c.
Structural rivets	3.95c.
Boiler rivets	3.95c.
	Per Cent Off List
Tank rivets, ½-in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50

Union Twist Drill Co., Athol, Mass., has appointed the Pacific Mill & Mine Supply Co., Los Angeles, Cal., as its dealer in the Los Angeles district. The latter will carry a comprehensive stock of milling and gear cutters, hobs, drills, reamers, taps and dies.

Cincinnati

Sheet Backlogs Continue to Taper—Scrap Gains in Strength, Pig Iron Dull

CINCINNATI, July 30.—The continual sagging of the Southern pig iron market has contributed an undertone of uncertainty to the market and, although the quotations of Northern furnaces have not been affected, consumers of Northern iron are buying only in small quantities, in the expectation that price revisions will become more general. The prevailing Southern quotation is $14.50, base Birmingham, and a few small sales have been made at this price, but there have been no large inquiries to bring out concessions, and it is the opinion in the trade that $14 would be the lowest figure at which business could be done. A Muncie, Ind., melter is asking for 100 to 300 tons of Northern foundry iron, and a Cambridge, Ind., consumer wants 500 tons of the same grade. A third Indiana consumer is inquiring for 300 tons of malleable for third quarter.

Prices per gross ton, deliv'd Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$19.89 to $20.39
Ala. fdy., sil. 1.75 to 2.75	17.69 to 18.19
Ala. fdy., sil. 2.25 to 2.75	18.19 to 18.69
Tenn. fdy., sil. 1.75 to 2.25	17.69 to 18.19
S'th'n Ohio silvery, 8 per cent	26.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Finished Material.—Backlogs of district sheet mills were reduced slightly during the past week, as production exceeded demand. The volume of new business, however, was about equal to that of the preceding week and was better than usual for July. Although deliveries are a shade easier than a month ago, the situation is still far from satisfactory from the consumers' point of view and, consequently, some of them are specifying in excess of their needs to insure sufficient material to sustain production at a good rate. While most of the automobile manufacturers have withdrawn from the market until the annual inventory period during the latter part of August is passed, several companies are specifying sheets for new models. Despite the present recession of automotive requirements, district mill operators look for a brisk market in the early fall. Galvanized sheets for roofing materials are in increasing demand and, although reports of price discontent in the Southeast are being heard, manufacturers say that no sagging of the market is likely.

Coke.—Specifications for by-product foundry coke during July were better than in the preceding month, thus reflecting the continued activity of the foundries in this district. Oven operations are abreast of the demand and, consequently, shipments are about up to date. New business, however, is very light and consists chiefly of spot orders for immediate use.

Old Material.—Firmness in other markets is being reflected here, causing a slight scarcity in first class scrap. Dealers are paying good prices for heavy melting steel and specialty grades of scrap and, although there is very little buying, consumers are taking material on contract at a good rate. Scrap rails and cast iron borings are up 25c. a ton, while No. 2 busheling has broadened its spread 25c., making the new quotation $7 to $7.50, an increase of 25c. on the bottom and 50c. on the top.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	$13.50 to $14.00
Scrap rails for melting	14.00 to 14.50
Loose sheet clippings	9.00 to 9.50
Bundled sheets	11.00 to 11.50
Cast iron borings	9.25 to 9.50
Machine shop turnings	8.50 to 8.75
No. 1 busheling	10.50 to 11.00
No. 2 busheling	7.00 to 7.50
Rails for rolling	14.50 to 15.00
No. 1 locomotive tires	14.25 to 14.75
No. 2 railroad wrought	13.25 to 13.75
Short rails	18.50 to 19.00
Cast iron carwheels	12.75 to 13.25
No. 1 machinery cast	19.25 to 19.75
No. 1 railroad cast	15.25 to 15.75
Burnt cast	10.25 to 10.75
Stove plate	10.25 to 10.75
Brake shoes	10.25 to 10.75
Agricultural malleable	14.25 to 14.75
Railroad malleable	15.25 to 15.75

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.30c.
New billet reinforc. bars	3.15c.
Rail steel reinforc. bars	3.00c.
Hoops	4.05c.
Bands	3.50c.
Cold-fin. rounds and hex	3.85c.
Squares	4.35c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.45c.
Structural rivets	3.85c.
Small rivets	65 per cent off list
No. 9 ann'l'd wire, per 100 lb	$3.00
Com. wire nails, base per keg	2.85
Cement c't'd nails, base 100 lb. keg	2.85
Chain per 100 lb	8.75
	Net per 100 Ft.
Lap-weld steel boiler tubes, 2-in.	$16.00
4-in.	33.00
Seamless steel boiler tubes, 2-in.	17.00
4-in.	34.00

Youngstown

Best July Steel Output on Record—Pipe Demand Large

YOUNGSTOWN, July 30.—Another month of record-breaking steel production ends this week. Schedules in the district have averaged above 85 per cent, making this the best July on record. From present indications, August production and shipments will be equally as satisfactory. Makers of steel pipe have a larger volume of inquiries now than at any time this year, and much of this tonnage will be transferred to order books in August, it is expected. The Republic Iron & Steel Co., for example, is booked ahead for six weeks in its pipe mills, well into September. Most of the new pipe tonnage is for pipe line projects. The Republic company is producing substantial tonnages of 4-in. and 6-in. tubing on its new electric welding tube mill. Foundations have been laid for two additional mills to roll larger pipe by this method under the Johnson patents, but it will be well into next year before they are completed. The new capacity will provide an additional outlet for the company's plate mill at Lansingville.

Reports that the Republic company received an order for 100,000 tons of steel tubing from a Southern interest are incorrect, officials advise. The bulk of the order referred to was placed some time ago with the A. O. Smith Corporation, and the remainder was divided among a number of other producers.

Schedules this week in the Mahoning Valley show 46 of 51 independent open-hearth furnaces active, 113 of 120 sheet mills under power, tin mills close to capacity, independent bar mills at 80 per cent and strip mills at above 90 per cent.

Valley steel companies are devoting considerable attention to water transportation, both of finished steel and inbound raw materials. The Sheet & Tube company has made arrangements for warehouse facilities at Memphis, Tenn., and expects to ship as much of the stock as possible by way of the Ohio and Mississippi rivers. Some Sheet & Tube company coal is being shipped from Pennsylvania to Ohio partly by barge. Valley pipe makers are making substantial shipments, especially of seamless tubing, to southern California via Baltimore and the Panama Canal.

Iron Castings Business Reported Good

The Gray Iron Institute, Terminal Tower Building, Cleveland, reports that production in June of 119 member foundries was 28,114 tons, which was at the ratio of 113.2 per cent, considering the average monthly production during the last three calendar years as 100. Forty foundries report business prospects as good, 56 fair and 7 poor.

New Members

The following new members have been elected: Barnett Foundry & Machine Co., Irvington, N. J.; Kelly Foundry Co., Pittsburgh; James McKinney & Son, Albany, N. Y.; Brooklyn Foundry Co., Astoria, N. Y.; Old Colony Foundry Co., East Bridgewater, Mass.; Gibby Foundry Co., East Boston, Mass.; L. W. Pond Machine & Foundry Co., Worcester, Mass., and Central Foundry Co., Joplin, Mo.

Buffalo

With Heavy Furnace Backlogs, Pig Iron Prices are Firm —Steel Operations at Capacity

BUFFALO, July 30.—With all the Buffalo furnaces having heavy backlogs, the situation in this district on pig iron is firmer, and this has been made apparent by a tightening of prices on eastern delivery. One interest has instructed its Eastern agents to accept no more iron of any tonnage without referring it to the home office. Under no circumstances will this furnace accept any business in the East more than $1 under the Buffalo base. This particular interest sold 25,000 tons during June and has already booked 24,000 tons for the fourth quarter. The Eastern Malleable Co. is understood to have withdrawn its inquiry for 3000 tons of malleable. A Massachusetts inquiry for 4000 tons mentioned last week has been partially placed and it is understood that part of the tonnage came to Buffalo. A Franklin, Pa., melter bought 800 tons. The Massey-Harris inquiry from Batavia has not yet been placed and the tonnage has been expanded to include the requirements of the Toronto plant.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$19.50
No. 2X fdy., sil. 2.25 to 2.75	20.00
No. 1 fdy., sil. 2.75 to 3.25	21.00
Malleable, sil. up to 2.25	20.00
Basic	18.50
Lake Superior charcoal	27.28

Finished Iron and Steel.—The market for all grades manufactured in this district continues very good and operations of the local mills show no evidence of any seasonal falling off. Open-hearth operation is as high now as it has been at any period of this year and mill operation is close to 100 per cent. One interest is maintaining its mills at double turn except when it is unable to get the steel. There has been a steady booking of small lots of reinforcing bars and fabricated structural, but no large tonnage has been placed during the week.

Old Material. — The outstanding transaction of the week was the purchase of 2000 tons of stove plate at $13.50. There have been a few small sales of heavy melting steel, and the market remains unchanged. Dealers continue to pay $17 on an old order of No. 1 at $17.25 to $17.50 and $14.25 to $14.50 on an old order of No. 2 heavy melting steel. Dealers are also paying as high as $11 on old cast iron borings orders. Strength of specialties in the outside markets is having a firming effect on the Buffalo market for knuckles and couplers, rolled steel wheels and coil and leaf springs. With Pittsburgh and Youngstown points paying $22, volume of receipts in the Buffalo territory has been curtailed.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$17.00 to $17.25
No. 2 heavy melting steel	14.75 to 15.00
Scrap rails	16.50 to 17.00
Hydraul. comp. sheets	14.50 to 14.75
Hand bundled sheets	12.00 to 12.50
Drop forge flashings	14.25 to 14.50
No. 1 busheling	15.50 to 16.50
Hvy. steel axle turnings	14.00 to 14.50
Machine shop turnings	7.50 to 7.75
No. 1 railroad wrought	13.00 to 13.50
Acid Open-Hearth Grades:	
Knuckles and couplers	19.00
Coil and leaf springs	19.00
Rolled steel wheels	19.00
Low phos. billet and bloom ends	20.00 to 20.50
Electric Furnace Grades:	
Short shov. steel turnings	12.00 to 12.50
Blast Furnace Grades:	
Short mixed borings and turnings	11.00 to 11.50
Cast iron borings	10.50 to 11.00
No. 2 busheling	10.00 to 10.50
Rolling Mill Grades:	
Steel car axles	18.75 to 19.25
Iron axles	21.00 to 22.00
Cupola Grades:	
No. 1 machinery cast	16.00 to 17.00
Stove plate	13.00 to 13.50
Locomotive grate bars	12.50 to 13.00
Steel rails, 3 ft. and under	19.00 to 19.50
Cast iron carwheels	14.00 to 14.50
Malleable Grades:	
Industrial	18.00 to 18.50
Railroad	18.00 to 18.50
Agricultural	18.00 to 18.50
Special Grades:	
Chemical borings	12.50 to 13.50

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.95c.
Cold-fin. flats, sq. and hex.	4.45c.
Rounds	3.95c.
Cold-rolled strip steel	5.85c.
Black sheets (No. 24)	4.20c.
Galv. sheets (No. 24)	4.85c.
Blue ann'l'd sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$3.60
Black wire, base per 100 lb.	3.75

Detroit

Dealers' Stocks Still Small in Low-Priced Cars

DETROIT, July 30.—The most encouraging aspect of the present situation in automotive production lies in the fact that the demand for automobiles continues to exceed the volume usually expected during midsummer. Consequently, the decline in production at this season has been smaller and more gradual than in former years. In fact, dealers' stocks in the low-price car field are still exceedingly small in some sections of the country, buyers being forced to wait for delivery. And this demand is not controlled by any one manufacturer, as indicated by production volume in the Ford, the Chevrolet and the Willys-Overland plants. The Ford Motor Co. turned out its two millionth car on July 24 and it is reported that the minimum wage scale of Ford employees is soon to be increased.

The Durant Motor Co., Inc., announces a new model, the 6-63, a six-cylinder car priced midway between the 6-60 and the 6-66 models.

By Aug. 1, demand for automotive steel should begin to show an improvement and specifications for September and October deliveries should begin to come in.

Orders for hot and cold-rolled strip so far this month show an increase of about 25 per cent over those received during the same period of 1928. Full-finish automobile sheets show a fairly satisfactory demand, with prices firm. However, there no longer exists any difficulty in getting semi-finished material at second quarter prices.

Automobile body sheets remain at 4.10c., Pittsburgh, with cold-finished bars at 2.30c. Hot-rolled strips, 6-in. and narrower, stand at 2c., Pittsburgh, with wider than 6-in. at 1.90c., Pittsburgh.

The market is experiencing the usual slowing up in the structural field. Small-lot orders for steel have declined considerably during the past month, and at the present time there are not enough small alteration or addition jobs to keep the small fabricators busy.

Plans are being completed for the Capital Savings Bank at Lansing, Mich., which will be a 22-story building. No estimate of the steel requirements is yet available.

The Electric Autolite Co. announces plans for a $275,000 office building in Toledo, and the Detroit Aircraft Corporation has authorized the erection of a seaplane hangar in Grosse Isle, near Detroit.

With some further reductions in automobile production, scrap dealers are finding some difficulty in buying additional tonnage. The market is firm, with top prices of the range frequently being paid on blast furnace grades.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel	$14.00 to $14.50
Borings and short turnings	9.00 to 9.50
Long turnings	8.00 to 8.50
No. 1 machinery cast	12.50 to 13.00
Automobile cast	13.00 to 13.50
Hydraul. comp. sheets	13.75 to 14.25
Stove plate	9.00 to 9.50
New No. 1 busheling	12.50 to 13.00
Old No. 1 busheling	11.00 to 11.50
Sheet clippings	8.75 to 9.25
Flashings	12.75 to 13.25

Cut Tacks and Cut Nails

Simplified Practice Recommendation R47-28, promulgated by the United States Bureau of Standards, relates to cut tacks and small cut nails for a great variety of industrial purposes. Standard sizes for each such use are given in the pamphlet mentioned, which may be obtained for 10c. from the Government Printing Office, Washington. Standards include sizes of packages for the various kinds of tacks and nails.

Non-Ferrous Metal Markets

Copper Sales Larger, Tin Quiet, Lead Weak, Zinc Dull

NEW YORK, July 30.

Copper.—Impressive gains in foreign sales were made during the past week. Bookings averaged about 1400 tons daily with sales yesterday and today totaling approximately 3000 tons each. More liberal buying is attributed to the fact that consumers have let stocks dwindle to such a low point that they are forced into the market to fill immediate requirements. Domestic users, on the other hand, have purchased only small lots, but are inquiring for fair-sized tonnages. Producers declare that the pressure which has been exerted by customers to obtain lower prices is proving of no avail. They assert that the shading of quotations at the present time, after they have withstood the effects of an extended period of comparative inactivity, would be a needless concession. They expect their position to be strengthened by July production figures, which admittedly will show the results of the curtailment of output. The outlook is favorable for an improvement in domestic sales during August, while producers are confident that foreign users must continue buying at a steady rate to cover current needs. Electrolytic copper is quoted at 18c., delivered in the Connecticut Valley, and at 18.30c., c.i.f. usual European ports. Lake copper is unchanged at 18c. to 18.12½c., delivered.

Tin.—Following two weeks of exceptionally heavy buying, sales of Straits tin receded sharply the past week and were well under 1000 tons. Although some business has been booked for the last quarter of the year, the bulk of the tonnage was for spot delivery. The quietness of the market, however, did not adversely affect prices, which have fluctuated little. This is shown by the fact that spot Straits tin sold on July 24 at 47.25c., New York, and today was quoted at the same figure. Sellers are not pressing for orders at the moment and buyers have indicated a lack of interest. The London group did not take an active part in trading until late today, when they bought 200 tons, thereby imparting an underlying tone of firmness to the London market. Prices have trended slightly upward with spot standard quoted at £213 12s. 6d., future standard at £217 7s. 6d. and spot Straits at £217

THE WEEK'S PRICES, CENTS PER POUND FOR EARLY DELIVERY

	July 30	July 29	July 27	July 26	July 25	July 24
Lake copper, New York	18.12½	18.12½	18.12½	18.12½	18.12½	18.12½
Electrolytic copper, N. Y.*	17.75	17.75	17.75	17.75	17.75	17.75
Straits tin, spot, N. Y.	47.25	47.00	....	47.125	46.875	47.25
Zinc, East St. Louis	6.80	6.80	6.80	6.80	6.80	6.80
Zinc, New York	7.15	7.15	7.15	7.15	7.15	7.15
Lead, St. Louis	6.55	6.55	6.55	6.55	6.55	6.55
Lead, New York	6.75	6.75	6.75	6.75	6.75	6.75

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

Prices on rolled non-ferrous products are unchanged from those prevailing one week ago.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—
High brass ..... 23.25c.
Copper, hot rolled ..... 26.75c.
Zinc ..... 10.25c.
Lead (full sheets) ... 11.00c. to 11.25c.

Seamless Tubes—
High brass ..... 28.25c.
Copper ..... 29.25c.

Rods—
High brass ..... 21.25c.
Naval brass ..... 24.00c.

Wire—
Copper ..... 19.87½c.
High brass ..... 23.75c.
Copper in Rolls ..... 26.75c.
Brazed Brass Tubing ..... 30.87½c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also to St. Louis on shipments to points west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide ..... 33.00c.
Tubes, base ..... 42.00c.
Machine rods ..... 34.00c.

Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	23.25c.
Copper, hot rolled	27.75c.
Copper, cold rolled, 14 oz. and heavier	30.00c.
Zinc	10.75c.
Lead, wide	11.35c.
Seamless Tubes—	
Brass	28.25c.
Copper	29.25c.
Brass Rods	21.25c.
Brazed Brass Tubes	31.00c.

New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—		
High brass	21.12½c.	to 22.12½c.
Copper, hot rolled, Base sizes	27.75c.	to 28.75c.
Copper, cold rolled 14 oz. and heavier, base sizes	30.00c.	to 31.00c.
Seamless Tubes—		
Brass	26.00c.	to 27.00c.
Copper	29.12½c.	to 30.12½c.
Brazed Brass Tubes	29.12½c.	to 30.12½c.
Brass Rods	18.87½c.	to 19.87½c.

New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.50c.	to 11.00c.
Zinc sheets, open	11.50c.	to 12.00c.

Metals from New York Warehouse

Delivered Prices, Per Lb.

Tin, Straits pig	48.50c. to 49.50c.
Tin, bar	50.50c. to 51.50c.
Copper, Lake	19.50c.
Copper, electrolytic	19.25c.
Copper, casting	19.00c.
Zinc, slab	7.75c. to 8.25c.
Lead, American pig	7.50c. to 8.00c.
Lead, bar	9.50c. to 10.00c.
Antimony, Asiatic	10.50c. to 11.00c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure)	25.00c. to 26.00c.
Alum. ingots, No. 12 alloy	24.00c. to 25.00c.
Babbitt metal, commercial grade	30.00c. to 40.00c.
Solder, ½ and ½	31.00c. to 32.00c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	52.25c.
Tin, bar	54.25c.
Copper, Lake	19.50c.
Copper, electrolytic	19.25c.
Copper, casting	18.75c.
Zinc, slab	7.75c. to 8.00c.
Lead, American pig	7.25c. to 7.50c.
Lead, bar	9.75c.
Antimony, Asiatic	16.00c.
Babbitt metal, medium grade	18.75c.
Babbitt metal, high grade	56.50c.
Solder, ½ and ½	31.75c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged customers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	14.50c.	16.00c.
Copper, hvy. and wire	14.25c.	15.75c.
Copper, light and bottoms	12.50c.	13.75c.
Brass, heavy	8.50c.	9.50c.
Brass, light	7.50c.	8.50c.
Hvy. machine composition	11.50c.	12.75c.
No. 1 yel. brass turnings	9.75c.	10.50c.
No. 1 red brass or compos. turnings	11.25c.	12.25c.
Lead, heavy	5.25c.	5.75c
Lead, tea	4.25c.	5.25c.
Zinc	3.50c.	4.25c.
Sheet aluminum	14.00c.	16.00c.
Cast aluminum	12.25c.	14.25c.

2s. 6d. The primary market at Singapore has been steady at £221.

Zinc.—With producers adhering strictly to 6.80c., East St. Louis, for prime Western zinc, sales have been of negligible volume. Consumers are only interested in covering immediate requirements and consequently orders have been confined to small lots.

Lead.—Weakness in the price of lead was revealed the past week when sales were made at 6.50c., St. Louis, but quotations rapidly were reestablished at 6.55c. after a few orders had been taken at the lower figure. Bookings yesterday were about 1000 tons, but today buying fell off somewhat. Most consumers are specifying August deliveries.

Antimony.—The apparently pacific settlement of the Chino-Russian dispute has resulted in an easier market in Chinese metal, with spot selling at from 8.62½c. to 8.75c. and futures at 8.50c., duty paid, New York. The flurry of buying a week ago probably will still be reflected in continued light buying during the coming week.

Nickel.—The price of ingot nickel is 35c. a lb., of shot nickel 36c. and of cathodes of electrolytic nickel 35c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is selling at 23.90c. a lb., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, July 30.—The volume of sales is heavier and prices are unchanged. The old metal market is steady both in quotations and purchases by consumers.

Prices per lb., in carload lots: Lake copper, 18.50c.; tin, 48c.; lead, 6.65c.; zinc, 6.90c.; in less-than-carload lots, antimony, 9.62½c. On old metals we quote copper wire, crucible shapes and copper clips, 14c.; copper bottoms, 11.50c.; red brass, 11.50c.; yellow brass, 8c.; lead pipe, 4.50c.; zinc, 3.25c.; pewter, No. 1, 24.50c.; tin foil, 26c.; block tin, 36c.; aluminum, 12.87½c.; all being dealers' prices for less-than-carload lots.

Reinforcing Steel

Awards Drop to Low Point and Inquiries Are Small

LETTINGS dropped to a low point the past week, totaling only 4300 tons. The largest job was 1000 tons for a power house at Powerton, Ill. An office building at Seattle, Wash., will take 550 tons. Fresh inquiries of 3100 tons included 800 tons for a building at Barrington, Ill. Awards follow:

CAMBRIDGE, MASS., 200 tons, Harvard University dormitory, to J. C. Coleman & Sons.

DELAWARE, LACKAWANNA & WESTERN RAILROAD, 150 tons, coal pockets in Brooklyn, to McClintic-Marshall Co.

NEW YORK CENTRAL RAILROAD, 175 tons, shops at Harmon, N. Y., to McClintic-Marshall Co.

POWERTON, ILL., 1000 tons, power house, to American System of Reinforcing.

ASHTABULA, OHIO, 500 tons, Cleveland Electric Illuminating Co. building, to Bourne-Fuller Co.

KALAMAZOO, MICH., 100 tons, Park Hotel, to Concrete Engineering Co.

STEVENS POINT, WIS., 250 tons, Hardware Mutual Life Insurance Co. building, to Concrete Engineering Co.

CEDAR RAPIDS, IOWA, 500 tons, filtration plant, to Laclede Steel Co.

SANTA MONICA, CAL., 300 tons, office building, Third and Santa Monica Streets, to unnamed bidder.

SACRAMENTO, CAL., 208 tons, highway work in Alameda County, to unnamed bidder.

ELLENSBURG, WASH., 200 tons, normal school, to Northwest Steel Rolling Mills.

OLYMPIA, WASH., 125 tons, highway work, to Northwest Steel Rolling Mills.

SEATTLE, 550 tons, Vance Building, to Northwest Steel Rolling Mills.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BOSTON, 300 tons, Boston & Maine Railroad hotel.

PHILADELPHIA, 700 tons, building for Atwater Kent Mfg. Co.

CHICAGO, 300 tons, Naval Hospital building.

CHICAGO, 250 tons, Fine Arts Building; R. C. Wieboldt & Co., general contractors.

CHICAGO, 130 tons, Irvale apartment building.

CHICAGO, 450 tons, Wilbur Wright School; W. E. O'Neil, general contractor.

CHICAGO, 125 tons, Parker School; Hanson Brothers, general contractors.

CHICAGO, 100 tons, Swift & Co., fertilizer plant.

CHICAGO, 275 tons, Henrici Restaurant; R. C. Wieboldt & Co., general contractors.

CHICAGO, tonnage not stated, apartment building on North Clark Street; Rosenthal & Cornell, general contractors.

BARRINGTON, ILL., 800 tons, Jewel Tea Co. building; Lundoff Bicknell Co., general contractor.

SAN FRANCISCO, 300 tons, opera house and war memorial buildings; bids postponed indefinitely.

New Chicago Maker of Rolled Products

A new company now in process of being incorporated for the purpose of manufacturing rolled steel products has acquired the former Whitman & Barnes Company plant, 120th and Morgan Streets, Chicago. The Sessions Engineering Co., Chicago, is engineer.

Boiler Makers Adopt Rules

WASHINGTON, July 30.—Trade practice rules governing the range boiler industry were issued yesterday by the Federal Trade Commission. On the basis of volume of business, it was estimated by the commission that 60 per cent of the industry was represented at the conference at which the rules were adopted.

Railroad Equipment

Orders and Inquiries for Locomotives Better

THE placing of two fair-sized orders and the appearance of inquiries from a number of carriers indicate a revival of interest in locomotive buying. The Northern Pacific and the Chilean State Railways have each contracted for 11 locomotives, while the New York Central is in the market for 35 oil-electric battery locomotives. The Burlington is considering the purchase of 25 locomotives. The Canadian Pacific has ordered 100 80-ton ore cars. Details of the week's business follow:

Canadian Pacific has ordered 100 80-ton ore cars from Canadian Car & Foundry Co.

Cudahy Packing Co. has ordered 50 steel underframes from Pullman Car & Mfg. Corporation.

Chicago, Milwaukee, St. Paul & Pacific has bought 15 steel caboose underframes from Bettendorf Corporation.

Chicago & Great Western has ordered two baggage mail cars from Pullman Car & Mfg. Corporation.

Northern Pacific has purchased 11 Yellowstone-type locomotives from Baldwin Locomotive Works.

Chilean State Railways has ordered 11 locomotives from Baldwin Locomotive Works.

Burlington is considering purchase of 25 locomotives.

St. Louis Southwestern is expected to buy 10 locomotives.

New York Central is in market for 35 oil-electric battery locomotives.

Nashville, Chattanooga & St. Louis will buy five freight locomotives.

Kentucky & Indiana Terminal is in market for 8 switching locomotives.

Louisville & Nashville is said to be contemplating purchase of passenger locomotives.

Minneapolis, St. Paul & Sault Ste. Marie is considering purchase of passenger engines.

Ford Scrap Sales in 1928

The Ford Motor Co., Detroit, has announced that the sale of scrap material of all kinds netted the company $3,573,877.60 during 1928. This figure represents only the scrap that was sold in the open market. Considerable quantities were used in the Ford company's own blast furnaces and open-hearth furnaces. The Ford company ships about 900 tons of scrap a day, of which about 500 tons is in the form of borings and turnings from machine shops; 300 tons of sheet steel scrap from the stamping shops and about 125 tons in the form of drop forge flashings obtained from the manufacture of such parts as the camshaft.

Brass Ingots Reduced

CHICAGO, July 30.—Brass ingot prices at Chicago were reduced July 29. Brass ingots of 85-5-5-5 composition were reduced from 16¼c. a pound to 15¾c.; 80-10-10 brass from 17½c. to 16¾c., and yellow brass ingots from 13c to 12¾c.

PERSONAL

The late LEWIS MILLER, who was for nearly 40 years the head of Aultman, Miller & Co., Akron, Ohio, manufacturers of Buckeye harvesting machinery, which he invented, was cofounder in 1873 with the late BISHOP JOHN H. VINCENT, of the famous Chautauqua Institution, at Chautauqua Lake, N. Y. On July 24 the centenary of Mr. Miller's birth was celebrated at Chautauqua. At the evening exercise in the amphitheater, before an audience of 10,000, THOMAS A. EDISON and HENRY FORD, guests of honor, made brief responses. Addresses were made by ADOLPH S. OCHS, publisher of the New York *Times*; DR. ELMER A. SPERRY, president of the American Society of Mechanical Engineers, who brought greetings from the national engineering societies; ALVIN I. FINDLEY, editor *The Iron Age*, and JUDGE WILLIAM L. RANSOM, New York, president of the board of trustees of the Chautauqua Institution.

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W. E. WORTH has been appointed Pacific Coast representative, with offices at 216 Pine Street, San Francisco, for the American Gas Furnace Co., Elizabeth, N. J.

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GEORGE W. DAVIS, formerly of the Chicago office of Gears & Forgings, Inc., Cleveland, has been made district manager of the Minneapolis office of the company.

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ARTHUR W. KLINGMAN, for 25 years associated with the Bourne-Fuller Co., Cleveland, has been made vice-president of the Foster Bolt & Nut Mfg. Co., Cleveland.

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I. EDMUND WAECHTER has resigned as superintendent of the Illinois Foundry Co., Springfield, Ill., to become general superintendent of the L. N. N. Foundry Co., Cleveland.

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GEORGE H. BANCROFT, for the past four years assistant purchasing agent for the Willys-Overland Co., Toledo, Ohio, has been appointed purchasing agent, succeeding the late WILLARD H. CALKINS. He was graduated from the University of Michigan in 1912 and taught engineering there for two years. Later he engaged in the general practice of engineering until after the war and in 1919 entered the automobile industry with the Oakland Motor Car Co.

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J. T. BENCHOFF has been made district manager of the newly-opened office in the Marshall Building, Cleveland, of the Landis Machine Co., Waynesboro, Pa.

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CHARLES E. EVELETH, who since 1927 has been a vice-president of the General Electric Co., in charge of the manufacturing department with C. C. CHESNEY and W. R. BURROWS, has been transferred to the engineering department of the company, and will be associated with E. W. ALLEN. Mr. Eveleth will give special attention to the problems of the designing departments and works laboratories, and Mr. Allen will have charge of the commercial engineering, the contract service and district engineering departments.

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HENRY S. RAWDON, who, as announced in THE IRON AGE of July 25, has been appointed chief of the Division of Metallurgy, Bureau of

HENRY S. RAWDON

Standards, Washington, was born in England. He was educated in the public schools in Michigan and was graduated from Michigan Normal College. He was a high school principal and superintendent for six years. In 1912 he received the degree of metallurgical engineer from the University of Michigan. As assistant physicist in charge of metallography in the division of metallurgy of the Bureau of Standards, he was sent to England and France to study the question of phosphorus and sulphur in steel. He has been active in committee work of the American Society for Testing Materials and other technical societies.

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JAMES F. EDNIE, foreman of the tool-treating shop of the armor plate department, Carnegie Steel Co., Homestead, Pa., has become assistant metallurgist of the Union Switch & Signal Co., Swissvale, Pa.

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ARTHUR T. KATHNER, inventor of the Kathner normalizing furnace, has sailed for Europe to further the sale and servicing of his furnace.

S. F. SIDES has been appointed direct sales representative in Los Angeles for the Union Twist Drill Co., Athol, Mass. He has been associated for the past eight years with the Goddard & Goddard Co., Detroit, in the Pacific Coast territory.

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R. M. BRUSHINGHAM has been made district manager of the Edgar Allen Steel Co., Inc., New York, in charge of its Detroit office, which will be opened at 704 Fisher Building, Aug. 3. He was associated for 12 years with the Colonial Steel Co., for the past four years as representative in Detroit.

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THOMAS O'BRIEN, formerly manager of the Farrell, Pa., works, American Sheet & Tin Plate Co., has been appointed manager of the Gary, Ill., tin mill of that company, succeeding W. C. LOYD, who has resigned. Mr. O'Brien has been succeeded at Farrell by JOHN A. BUTLER, recently manager of the company's New Castle, Pa., works. E. R. THOMPSON has been named manager at the New Castle works. JOHN N. CROMBIE, recently assistant manager of the company's Laughlin works, Martins Ferry, Ohio, has been made assistant manager of the Shenango works at New Castle. HAROLD S. PYLE has been named assistant manager of the Laughlin works, succeeding Mr. Crombie. R. B. SAYLOR has been appointed assistant manager of the Wellsville, Ohio, works, and A. G. RINDERKNECHT has been named to a similar position at the Dover, Ohio, works. These appointments are effective Aug. 1.

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GROVER C. BROWN, chief civil engineer at the Cambria plant of the Bethlehem Steel Co., Johnstown, Pa., has been appointed management representative at that plant. He succeeds C. L. BAKER, who has been transferred to the company's Lackawanna, N. Y., works.

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JOHN ECKERLE, president, Aluminum Industries, Inc., Cincinnati, sailed on the Bremen, July 29, for a tour of Germany and of several other European countries.

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JAMES A. FARRELL, president and chief executive officer of the United States Steel Corporation, sailed for Europe on the Leviathan July 27. He was accompanied by Mrs. Farrell, James A. Farrell, Jr., and Miss Rosamond Farrell. After visiting Paris the party will go to San Sebastian, Spain, on the coast of the Bay of Biscay.

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CHARLES E. SATLER has resigned as secretary of the United Engineering & Foundry Co., Pittsburgh, after 44 years of service with the company. GEORGE H. FRIESEL, treasurer, has been elected secretary in addition to his regular duties. J. H. HILLMAN, JR., chairman Hillman Coal & Coke

Co., and prominently identified with numerous Pittsburgh industrial enterprises, has been elected a director of the United company.

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JEAN ROCHE, senior engineer at Wilbur Wright Field, Dayton, Ohio, will become president of the Aeronautical Corporation of America, Cincinnati, Aug. 15. He is the inventor of a flivver plane. He formerly worked for the Standard Airplane Co., at Elizabeth, N. J.

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J. BLAIR SUTTON, president, Sutton Engineering Co., Pittsburgh, has returned from a three months' business trip in Europe.

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E. C. FAUSTMANN, formerly vice-president of the Royal Typewriter Co., Hartford, Conn., has been made president to succeed G. E. SMITH, who resigned.

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J. H. COLLIER, general manager of the Crane Co., Bridgeport, Conn., plant, has been made general supervisor of the company's European valve business. A. E. MACDONALD, Bridgeport plant superintendent, succeeds Mr. Collier as general manager.

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KENNETH M. LANE, designer of the airplane which last May broke the world's altitude record, has been appointed chief of the aeronautical engineering section of the Department of Commerce.

Obituary

WILLIAM PIGOTT, vice-president, Pacific Coast Steel Co., Seattle, Wash., died in Vancouver, B. C., July 19, following a stroke of apoplexy suffered on July 4.

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JOHN FELTES, vice-president, Standard Electric Tool Co., Cincinnati, died of pneumonia at his home in Cincinnati, July 24.

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LOUIS WAKEMAN PENFIELD, president, Hadfield Penfield Steel Co., Cleveland, died Monday night, July 29, at his home in that city, following a long illness. He was 72 years of age.

Sharp Drop in Canadian Motor Car Output

Automobile production in Canada in June totaled only 21,492 cars, compared with 31,559 in May. The latter figure represented the first recession following the rapid rise in output from January through April. Compared with May, output in June showed declines in closed passenger models, trucks and chassis and increases in open passenger cars, taxicabs and buses.

New Trade Publications

Steel Castings.—Nugent Steel Casting Co., Chicago. A two-page illustrated leaflet describes steel castings which are used in the production of the Buda 619 heavy-duty motor car which is a small gasoline-driven engine. All castings used in the chassis of this engine are made of steel.

Steel Castings.—Lebanon Steel Foundry, Lebanon, Pa. A four-page leaflet, illustrated, describes the application of special electric steel castings which are used by the Worthington Mower Co. in the production of its special motor-driven and other lawn mower equipment where light-section steel castings are essential.

Cupola Blowers.—General Electric Co., Schenectady, N. Y. A four-page illustrated leaflet describes the single-stage centrifugal air compressors for cupola blowing produced by that company. Charts are given showing the results of the use of these blowers as well as tables, giving air volume requirements and size of sets recommended for various iron to coke ratios.

Roof Slabs.—Federal Cement Tile Co., Chicago. A 36-page catalog describes featherweight concrete insulating roof slabs manufactured by this company. The catalog contains the story and detail drawings of these slabs, specifications and data in regard to weights and dimensions, detail drawings and essential data about featherweight nailing concrete roof slabs and a partial list of users of the products. The catalog is profusely illustrated.

Controllers and Switchboards.—Electric Controller & Mfg. Co., Cleveland. Three bulletins have been issued by this company. No. 970, describing a.c. manual controllers, includes the V-4 dinkey controller for use with duplex drives having two motors mechanically connected to the same drive. No. 1021, covering d.c. type S crane switchboards, includes 115-volt and 550-volt ratings. Dimensions have been revised to apply to newly designed shunt contactor. No. 1037-D, covering a.c. and d.c. type B limit stops, has been revised to show dimensions of the new style contactor.

Electric Meters.—Sangamo Electric Co., Springfield, Ill. Bulletin No. 78, consisting of 16 pages, tells of the uses of Sangamo type N ampere-hour meter. Illustrations of parts and wiring diagrams are shown in this booklet.

Twist Drills.—New Process Twist Drill Co., Taunton, Mass. A new edition of a catalog covering complete line of high speed and carbon twist drills has been issued. Catalog includes photographs showing methods of manufacturing forged twist drills.

Power Pumps. — Goulds Pumps, Seneca Falls, N. Y. Catalog "S" and handbook, bound together in limp covers, includes 72 pages in the catalog and 32 pages in the handbook. The catalog is thoroughly illustrated and includes a wide variety of types of pumps operated by steam or from belts or by electric motors. The handbook is full of data, including installation diagrams, illustrative examples intended to assist in selecting the proper pump and figuring the suction lift, head, horsepower, pulley sizes, etc. This is in the nature of a treatise on the subject.

Flexible Couplings. — Westinghouse Electric & Mfg. Co., East Pittsburgh. Circular 1838, devoted to flexible couplings made at Nuttall works. Particulars relating to construction, application and maintenance of couplings designed for use with speed reducers are included.

Marine Oil Engines.—Ingersoll-Rand Co., 11 Broadway, New York. Bulletin of 24 pages, illustrating and describing Diesel engines for marine use in driving a wide variety of vessels.

Diesel Engines.—Busch-Sulzer Brothers-Diesel Engine Co., St. Louis. Four pamphlets devoted to Diesel engines used in developing electric power. Information regarding operation and maintenance expenses is given in some detail.

Rail Steel Bars.—Rail Steel Bar Association, 228 North La Salle Street, Chicago. Booklet of 16 pages, devoted to the use of rail steel bars for concrete reinforcement. Illustrations show methods of preparation of the bars, methods of bending and installation. Standard specifications of the American Society for Testing Materials are given.

Blow Guns and Forge Blowers.—Schutte & Koerting Co., Philadelphia. Bulletin 4-T, of four pages, illustrates and describes blow guns for the use of compressed air and forge blowers. The illustrations, which are in color, show the action of the compressed air and its entrainment of air from the main suction lines.

Bonding Cement for High Temperature.—Chicago Fire Brick Co., 1439 Elston Avenue, Chicago. Folder of four pages devoted to a high-temperature bonding cement recommended for bonding fire brick in a wide variety of metallurgical and other furnace uses. It is shipped in two forms—hotset, to be mixed with water, and coldset—a concentrated, hydrated mixture.

Flexible Shafts. — Stow Mfg. Co., Binghamton, N. Y. Bulletins 100 and 150 of four pages each illustrate and describe a line of flexible shafting for use in a wide variety of services, of which that of the dentists' equipment is perhaps most familiar. Considerable data will be found in the pamphlets covering this flexible shafting and its uses.

Electrically Welded Pipe.—A. O. Smith Corporation, Milwaukee. Bulletin 505 of 52 pages, illustrated, tells of the Smith method of welding steel plate into pipe by electrical means and gives many illustrations of the use of this pipe. Data of an engineering character cover sizes, weights and strength, and even such items as the freight cost entering into the use of this pipe.

Air Compressor and Vacuum Pumps.—Pennsylvania Pump & Compressor Co., Easton, Pa. Bulletin No. 147, consisting of 24 pages, contains an interesting cross-sectional view of the company's compressor, together with description and illustrations of Pennsylvania methods of compressor regulation.

European Mills Lack Export Business

Unsettled Condition in Far East Is Factor—Government Committee to Survey British Steel Industry—English Pig Iron Strong

(*By Cable*)

LONDON, ENGLAND, July 29.

PIG iron demand is now affected by the holiday periods and but little improvement is expected before early fall. Cleveland makers, however, are well booked for two months and further advances in prices are regarded as possible, although with raw material output increasing and an expected decrease of costs, Cleveland makers are at present willing to book forward business at current prices.

Hematite iron is stiffening, as low priced ore and fuel contracts are expiring. Based on current raw material prices, hematite iron costs more than £4 ($19.40) a ton to produce, so that the tendency is upward. Meanwhile, consumers' demands have eased with the holiday season.

Finished steel is generally quiet for export, but domestic consumers have bought moderately and Northeast Coast makers are hastening to execute orders before their vacation periods begin. Prices are strong with an upward tendency.

Continental sales here are at a minimum and mills are actively seeking to increase sales, so that prices are declining.

Tin plate inquiry is fair, but business is slow. An important Welsh group is well sold up to the end of the year at full prices. Consequently, makers are generally inclined to take a firmer view and more mills are suspending rather than to sell tin plate at 18s. 3½d. ($4.43) per base box, f.o.b. works port. The market is therefore expected to develop a firmer tone.

Galvanized and black sheets are inactive.

The Government committee appointed to inquire into conditions in the iron and steel industry comprises Lord Sankey, A. U. Alexander, Sir Cecil L. Budd, T. C. Cramp and Sir William Plender. The committee will consider and report upon the present condition and prospects and make recommendations as to any action which may appear desirable and practicable to improve the position of the iron and steel industries in world markets.

Dorman, Long & Co. have secured a contract for £262,000 ($1,270,700) for a memorial road and bridge at Bangkok, Siam.

German raw steel output in June was 1,430,000 metric tons. Belgian production in June was 342,000 tons of pig iron and 339,000 tons of raw steel. On July 1, 57 Belgian furnaces were in blast. Belgian mills have booked 75,000 tons of rails and other contracts through the International Rail Makers' Association are pending.

Luxemburg production in June totaled 242,000 metric tons of pig iron and 218,000 tons of raw steel. On June 30, there were 38 furnaces in blast. Saar output in June was 187,000 metric tons of pig iron and 190,000 tons of raw steel. On June 30 there were 28 furnaces in blast.

Summer Quiet in Great Britain

Holidays Curtail Business—Last Quarter Pig Iron Sold —Steel Export Committee Going to South America

LONDON, ENGLAND, July 19.—Midsummer quiet has set in and, with Scottish plants closed for a week to 10 days and holiday periods coming in other sections, little improvement in business is expected until fall. It is noteworthy, however, that the number of blast furnaces in operation has steadily increased throughout the year. Since last December the number in blast has been augmented by 15 furnaces and more are operating now than at any time since August, 1927. Pig iron production in the past six months has been about 5 per cent greater than in the first half of 1928, and the increase would have been even greater had not the output in February been unusually small.

The improvement in the pig iron market has been largely due to the curtailment of imports because of in-

British and Continental European Export prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp, with the £ at $4.85

British Prices, f.o.b. United Kingdom Ports

Cleveland No. 3 foundry	£3	12½s.	to	£3	13½s.	$17.58	to	$17.82
East Coast Hematite	3	15	to	3	15½	18.18	to	18.30
Ferromanganese, export	13	10	to	14	0	65.47	to	67.90
Billets, open hearth	6	7½	to	6	10	30.92	to	31.52
Sheet bars, open hearth	6	5	to	6	10	30.31	to	31.52
Black sheets, Japanese specifications	13	0	to	13	5	63.05	to	64.26
Tin plate, per base box	0	18¼	to	0	18½	4.40	to	4.48
Rails, 60-lb. and heavier	7	15	to	8	15	37.59	to	42.43
						Cents per Lb.		
Steel bars, open hearth	7	15	to	8	10	1.67	to	1.84
Beams, open hearth	7	2½	to	7	12½	1.55	to	1.65
Channels, open hearth	7	7½	to	7	17½	1.60	to	1.71
Angles, open hearth	8	2½	to	8	12½	1.76	to	1.86
Ship plates, open hearth	7	12½	to	8	2½	1.66	to	1.76
Black sheets, No. 24 gage	10	5	to	10	10	2.21	to	2.27
Galvanized sheets, No. 24 gage	13	5	to	13	7½	2.91	to	2.94

Continental Prices f.o.b. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 0.50 to 0.90 per cent phos.	£3	9s.	to	£3	13½s.	$16.73	to	$17.82
Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	3	11				17.21		
Billets, Thomas	4	19	to	5	2	24.00	to	24.73
Sheet bars, Thomas	5	2½	to	5	3	24.86	to	24.98
Wire rods low C., No. 5 B.W.G.	6	4	to	6	6¼	30.06	to	30.61
Black sheets, No. 31 gage, Japanese	12	15				61.83		
Rails, 60 lb. and heavier	6	10*				31.52		
Rails, light	6	1½				29.46		
						Cents per Lb.		
Steel bars, merchant	5	13	to	5	14	1.25	to	1.27
Steel bars, deformed	5	12	to	5	12½	1.21	to	1.22
Beams, Thomas, British standard	5	4	to	5	8	1.12	to	1.15
Channels, Thomas, American sections	6	0				1.32		
Angles, Thomas, 4-in. and larger, over ¾-in. thick	5	6				1.14		
Angles, Thomas, 3-in.	5	16				1.28		
Ship plates, open-hearth inspected	7	10				1.62		
Hoop and strip steel, over 6-in. base	6	0	to	6	2½	1.32	to	1.33
Wire, plain, No. 8 gage	7	7½				1.62		
Wire, galvanized, No. 8 gage	9	7½				2.02		
Wire, barbed, 4-pt. No. 12 B.W.G.	11	17½				2.56		
Wire nails, base	0	7¾				$1.87 per keg		
Wire nails, assortments, 1 to 6-in., keg	10	6½				2.23		

*Open-hearth steel, 10s. ($2.42) per ton extra.

creased costs at Continental furnaces. This has not only aided British furnaces in their own domestic market, but has enabled them to regain certain foreign markets. Cleveland furnaces, which are in a particularly prosperous position, have opened their books for last quarter contracts following withdrawal from the market for several weeks. Hematite iron lacks the strength exhibited by Cleveland prices, as there is no control among hematite producers of prices and production. However, makers have little iron to sell for delivery before August and are able to sell without shading ruling market quotations. Export demand for hematite is improving, with both Belgian and Italian consumers actively inquiring for tonnage.

Steel mills have not had a comparable improvement in business, as their market is still partly influenced by Continental competition. At present, however, European mills report a lack of substantial tonnage for export. The unsettled situation in the Far East and depreciated exchange are obstacles to betterment in demand, but the steel makers' export committee has negotiated some good business in ship material for Japan. Following their recent Canadian visit, members of export committee are sailing in August for a tour of South America.

Under the Labor Party administration the question of safeguarding iron and steel has become less prominent, although certain members of the opposition are still urging its adoption. The new government, however, is opposed to protection, although it announced that a comprehensive inquiry will be made into the position of the iron and steel industry.

According to Lloyd's Register of Shipbuilding, vessels under construction in the United Kingdom in the quarter ended June 30 totaled 1,453,906 tons, an increase of 96,531 tons from the previous quarter. Tonnage under construction abroad decreased 96,118 tons to 1,384,319 tons at the end of the second quarter.

Germany Buys Russian and Indian Manganese Ore

HAMBURG, GERMANY, July 16.—The largest manganese ore contract this year has just been placed. A German consumer has bought 100,000 tons of Caucasian manganese ore from Poti, Georgia, at 1s. to 1s. 1d. (24c. to 26c.) per unit, delivered, the price varying with the quality of the ore. A contract for 26,000 tons of Indian manganese ore has been closed at 1s. ½d. to 1s. 1½d. (25c. to 27c.) per unit, depending upon the quality.

Construction of an all-welded 8000-bbl. oil barge has been begun by Truss-Weld Barge Co., Elizabeth, N. J. It will be 134 ft. long, 33 ft. beam and 12.5 ft. deep, and is especially planned for service on the New York State Barge Canal.

German Steel Business Improving

Unemployment Declining As Domestic Buying Increases —Export Trade Good But Prices Are Irregular

BERLIN, GERMANY, July 16.—Business has begun to improve and the number of unemployed has declined to less than one-third of the February total. While foreign trade has receded, seasonal improvement is expected in the fall. In the domestic market, building is more active and manufacturers are again expanding output. Demand from machinery builders is heavier and there is an active market in small finished products, cutlery and hardware.

Producers of semi-finished material have sufficient tonnage on their books to carry them into October in many instances, although in large measure this is the result of the increased activity of their own finishing mills rather than a larger demand from rolling mills that buy in the open market. Business in bars, bands, heavy and light-gage sheets has improved, but medium-gage sheets are inactive and show a downward tendency.

Export business in the past fortnight has been irregular and rather restricted. The German syndicates have endeavored to maintain their export prices, although affected by weaker quotations in France and Belgium. Business in steel bars in South America, the Dutch East Indies and the Far East is quite active, but consumers of bars in other markets have not been buying recently. An effort by German sellers to maintain bar prices at £6 per ton (1.30c. per lb.), which is 8s. ($1.94) per ton less than the high point reached this year, has been unsuccessful, and this month the Stahlwerksverband has reduced its quotations to a range of £5 17s. 6d. to £5 18s. per ton (1.27c. to 1.28c. per lb.).

Exports of Solingen cutlery are increasing and sales to France, Great Britain and Italy are reported satisfactory, with unusually large sales to British India, although at low prices.

Imports of heavy iron and steel, including scrap, in the first quarter of this year, totaled 738,017 tons, while exports were 2,313,737 tons. An interesting feature of the scrap trade was the virtual balance between exports of 123,401 metric tons and imports of 120,061 tons. In other products there was a considerable difference between imports and exports. Imports of pig iron totaled 69,008 tons and exports 139,685 tons; imports of shapes, including bars and bands, totaled 275,668 tons, while exports were 536,537 tons; imports of wire were 42,764 tons and exports 221,849 tons; sheet imports were 29,511 tons and exports 214,801 tons, and rail and steel tie imports were 48,969 tons and exports 155,175 tons.

Labor Scarcity in France Attracts Foreigners

BORDEAUX, FRANCE, July 15.—Labor shortage continues in a majority of French industries. The total number of unemployed listed in the Paris area during one week in May was 335. In the metallurgical and engineering industries at this time there were 2451 offers of employment and only 208 applicants. From mines and quarries there were 1772 offers of employment and only 13 applicants. In the same week 1694 foreign workers were added to French industrial payrolls.

German Machinery Exports Gaining

BERLIN, GERMANY, July 16.—The Machinery Manufacturers' Association reports a further gain in orders booked in June. Domestic orders for machinery have been increasing since March and foreign business has been active since last fall. In the first half of this year 44 per cent of all machinery sales by members of the association was for export, compared with 36 per cent in the first half of last year. The greatest demand was for power equipment and machine tools. Builders of printing machinery and mechanical mining equipment report that they are increasingly dependent on foreign business. On the basis of orders now on the books of association members, output for the year will exceed the 1928 total by 200,000,000 m. ($47,600,000).

Germany Sells More Wire and Cable to United States

HAMBURG, GERMANY, July 16.—In May the United States advanced to first place as a buyer of German wire rope, taking 115 tons. The United Kingdom was second with 105 tons, Holland was third with 102 tons and Brazil fourth with 101 tons. In wire nails the United States has advanced as a buyer of the German product from seventh place in 1928 to third place this year. In May the United Kingdom received 1500 tons of wire nails, China 860 tons and the United States 730 tons. The United States also ranked third as a buyer of barbed wire, Brazil leading with 1600 tons, India second with 900 tons and the United States third with 700 tons. Germany's total exports of wire and wire products were 62,000 tons in May.

German Use of Welding on Ships Increasing Rapidly

HAMBURG, GERMANY, July 16.—Electric welding is being increasingly used for the fabrication of ships in Germany, having been adopted by Messrs. Blohm & Voss, Hamburg; by Deschimag, a merger of five German yards; by the Deutsche Werft at Kiel, which is building German battleships and by the Government yard at Wilhelmshafen. The latest use of electric welding is in the construction of merchant ships up to 10,000 to 12,000 tons. The next ships to be built by Deschimag at Bremen and Hamburg for the North German Lloyd line will be electrically welded.

In addition to the larger vessels, all river craft and steel barges on the Oder, Elbe and Rhine rivers are being electrically welded, and such craft exceeds the German tonnage on the seas.

While the weight saved on merchant vessels through electrical welding will be less than on warships with their heavy armor plate, it is expected to amount to 8 to 10 per cent (deadweight). The German Lloyd and British Lloyd have put electrically welded ships in the highest registered class, and the insurance companies accept them at 100 per cent value.

Swedish Exports Improve While Imports Decline

STOCKHOLM, SWEDEN, July 16.—Business in iron and steel has improved and orders on mill books for rolled products are larger than a year ago. Prices have advanced recently as a result of the increase in scrap quotations, but export prices are unchanged. In the first five months of this year exports of iron and steel totaled 109,164 metric tons, while imports, not including pig iron and scrap, totaled 104,508 tons. Imports, however, showed a decline from the total of 120,031 tons for the first five months of 1928, while exports increased from the 102,379 tons for that period.

Iron Ore Imports Continue Heavy in June

WASHINGTON, July 26.—June imports of iron ore, while less than those for May, continued the heavy movement of the past few months. The total was 243,913 gross tons, compared with 275,762 tons in May and with 284,134 tons in April. The imports were 188,892 tons in June, 1928. For the six months the imports reached 1,467,736 tons, which is 18 per cent higher than the total for the like period of last year.

Chile furnished a little more than half of the total imported in June. For the six months of the year, Chile's contribution was almost 53 per cent, with Cuba second and Sweden back in third place.

Gain in Italian Output of Machinery

The increased production of machinery in Italy since the war is revealed in a study of the Italian machinery industry by A. A. Osborne, assistant American commercial attaché, Rome. A characteristic of the industry is the small scale on which most establishments operate. Less than 5000 out of a total of 700,000 companies employed more than 100 workers each, according to a census made in 1927. Production, however, is so far advanced that in certain lines it is equal to domestic demand. Plants are equipped for the manufacture of most heavy electrical machinery and hydraulic equipment.

There is comparatively little output of machinery for special purposes, which in most cases must be obtained abroad. Moreover, most companies produce items of a widely diverse character, because the demand for any one class of machines is so restricted and competition is so keen that few establishments confine themselves to the production of specialized lines.

Thomas W. Ward, Ltd. Buys Yorkshire Blast Furnaces

LONDON, ENGLAND, July 19.—The properties of the Yorkshire Iron & Coal Co., Ltd., Leeds, recently acquired by the Frodingham Iron & Steel Co., Ltd., Scunthorpe, Lincolnshire, have been, for the most part, sold by the Frodingham Company to Thomas W. Ward, Ltd., Sheffield. The purchase includes the four blast furnaces and plant near Ardsley, the collieries near Morley and a large acreage of land. The new owner is expected to modernize part of the plant and to dismantle the rest.

SOURCES OF AMERICAN IMPORTS OF IRON ORE
(In Gross Tons)

	June		Six Months Ended June	
	1929	1928	1929	1928
Canada	298	303	505	10,326
Cuba	50,000	25,500	319,900	190,286
Chile	126,590	90,800	772,675	715,500
Spain	6,797	6,653	38,213	11,903
Sweden	27,331	.....	123,082	19,614
French Africa	12,930	47,350	97,910	241,371
Other countries	19,967	18,286	115,451	45,513
Total	243,913	188,892	1,467,736	1,234,513

United Steel Works Exports 40 Per Cent of Output

HAMBURG, GERMANY, July 16.—The United Steel Works, Düsseldorf, has issued the report for the third quarter of its business year—from April 1 to June 30. Production in all departments of the corporation showed an increase from the previous quarter, Jan. 1 to March 31. Coke output was 2,608,471 metric tons, compared with 2,431,578 tons in the preceding quarter, pig iron production 1,710,172 tons, compared with 1,660,403 tons, and steel ingot output 1,882,182 tons compared with 1,824,733 tons.

The number of employees on June 30 was 176,207, compared with 171,876 on March 31. The total, however, was 9700 less than at the end of the company's third quarter last year. The value of all sales during the quarter was 407,500,000 m. ($96,585,000) of which 159,200,000 m. ($37,889,600), or about 40 per cent, represented export business

Less Plate Work Placed in June—Half Shows Gain

WASHINGTON, July 30.—Orders for fabricated steel plate totaled 45,893 tons in June, against 47,763 tons in May, according to reports made to the Department of Commerce by 48 firms. The production ratios for the two months were 57.4 per cent and 59.8 per cent respectively. Of the June orders, 6890 tons was for oil storage tanks, compared with 10,087 tons in May; 4433 tons for refinery materials and equipment, against 4053 tons; 1998 tons for tank cars, compared with 960 tons; 5444 tons for gas holders, against 5300 tons; 1003 tons for blast furnaces, against 1245 tons, and 26,125 tons for stacks and miscellaneous requirements, compared with 26,118 tons in May.

For the first six months of the year, orders totaled 283,589 tons, representing 59.2 per cent of capacity, compared with 260,483 tons, or 54.4 per cent of capacity, for the corresponding period of last year. Comparative distribution of the tonnage during the first half of 1929 and during the corresponding period of last year, respectively, was as follows: Oil storage tanks, 76,154 tons and 111,010 tons; refinery materials and equipment, 28,867 tons and 16,032 tons; tank cars, 24,831 tons and 12,163 tons; gas holders, 27,257 tons and 20,261 tons; blast furnaces, 5761 tons and 3666 tons; and stacks and miscellaneous 20,719 tons and 97,351 tons.

Despatch Oven Co., Minneapolis, Minn., has appointed the Industrial Engineering & Equipment Co., 1341 Syndicate Trust Building, St. Louis, as its district sales representative for the State of Missouri and the southern portion of Illinois.

Less Steel Exported in June

Half-Year Increase Over Last Year Was 17½ Per Cent—Meanwhile Imports Fell 10 Per Cent

WASHINGTON, July 26.—Declining 13,705 gross tons, exports of iron and steel products from the United States in June totaled 247,811 tons, against 261,516 tons in May. For the six months ended with June, however, exports increased to 1,591,839 tons, a gain of 234,476 tons over the 1,357,363 tons exported during the corresponding period of last year. Exports in June, 1928, were 260,767 tons, or 12,956 tons in excess of the movement for June of the current year. The daily average shipment abroad in June, this year, was 8260 tons, against 8436 tons in May.

Imports in June also showed a slump, dropping to 63,635 tons from 74,272 tons in May, a decrease of 10,637 tons. For the first half of the present year imports declined 36,243 tons from those of the corresponding period of last year, the totals being 394,088 tons in 1928 and 357,845 tons in 1929. Imports in June of last year amounted to 66,602 tons, or 2967 tons above those for last month. The daily average import movement in June was 2121 tons, compared with 2396 tons in May.

Declines in exports in June as compared with May were reflected in 23, and gains were made in 14, of the 37 products listed in THE IRON AGE table. The sharpest drop was made in the outgoing shipments of scrap, with a total of 42,816 tons in June, against 55,916 tons in May. Steel bar exports decreased to 12,249 tons from 14,720 tons; plates to 17,640 tons from 20,185 tons and pig iron to 3101 tons from 8088 tons.

On the other hand, exports of galvanized sheets rose to 12,604 tons from 11,342 tons; tin plate to 18,041 tons from 14,537 tons; plain structural material to 31,268 tons from 30,331 tons, and fabricated material to 7363 tons from 6652 tons.

Among important gains in exports for the first six months over outgoing shipments for the like period of last year were those made in steel bars, which increased to 112,620 tons from 70,768 tons; plates increased to 107,296 tons from 71,726 tons; hoops, bands and strip steel, increased to 42,858 tons from 27,697 tons, and plain structural material, increased to 145,866 tons from 89,873 tons. The greatest decline was in exports of steel rails, which decreased to 85,566 tons from 109,124 tons.

Imports of Iron and Steel into the United States

(In Gross Tons)

	June		Six Months Ended June	
	1929	1928	1929	1928
Pig iron	11,396	11,799	73,461	75,295
Ferromanganese*	5,534	5,870	32,584	24,405
Ferrosilicon†	561	366	4,137	1,711
Ferrochrome‡	20	76	240	338
Scrap	6,658	7,715	43,273	22,844
Pig iron, ferroalloys and scrap	*24,169*	*25,826*	*153,695*	*124,593*
Steel ingots, blooms, billets and slabs	1,671	2,054	12,383	11,870
Wire rods	1,336	1,119	8,596	9,417
Semi-finished steel	*3,007*	*3,173*	*20,979*	*21,287*
Rails and splice bars	1,332	3,282	3,060	9,646
Structural shapes	12,274	14,438	69,107	88,842
Boiler and other plates	72	2,215	2,422	3,157
Sheets and saw plates	2,266	2,110	10,430	14,839
Steel bars	3,170	5,770	18,272	50,346
Bar iron	672	418	1,983	1,351
Hoops, bands and cotton ties	3,245	2,329	14,678	14,865
Tubular products (wrot.)	4,032	2,773	22,056	21,055
Nails, tacks, staples	1,079	688	4,540	3,843
Tin plate	27	42	142	592
Bolts, nuts, rivets and washers	32	17	136	143
Round iron and steel wire	295	344	3,266	2,032
Barbed wire	612	183	2,965	1,749
Flat wire; strip steel	162	134	1,103	1,207
Steel telegraph and telephone wire	....	25	....	143
Wire rope and strand	256	184	1,264	803
Other wire	85	1	349	278
Rolled and finished steel	*28,611*	*34,953*	*155,773*	*214,891*
Cast iron pipe	6,679	2,525	26,274	31,517
Castings and forgings	169	125	1,124	1,800
Total	63,635	66,602	357,845	394,088
Manganese ore*	51,290	12,650	165,602	83,917
Iron ore	243,913	188,892	1,467,736	1,268,413
Magnesite	3,511	7,825	12,111	27,474

*Manganese content only.
†Silicon content only.
‡Chromium content only.

Exports of Iron and Steel from the United States

(In Gross Tons)

	June		Six Months Ended June	
	1929	1928	1929	1928
Pig iron	3,101	5,674	30,790	25,329
Ferromanganese	104	338	1,013	4,861
Scrap	42,816	64,918	249,720	251,131
Pig iron, ferroalloys and scrap	*46,021*	*70,930*	*281,523*	*281,321*
Ingots, blooms, billets, sheet bar	4,199	755	25,051	10,299
Skelp	13,674	4,471	53,795	46,557
Wire rods	2,774	4,818	23,060	18,529
Semi-finished steel	*20,647*	*10,044*	*101,906*	*75,385*
Steel bars	12,249	13,816	112,620	70,768
Alloy steel bars	931	1,276	11,400	7,492
Iron bars	171	183	2,754	1,843
Plates, iron and steel	17,640	14,529	107,296	71,726
Sheets, galvanized	12,604	10,490	86,420	75,125
Sheets, black steel	15,718	19,223	92,763	90,311
Sheets, black iron	1,373	1,612	7,545	7,488
Hoops, bands, strip steel	6,275	4,820	42,858	27,697
Tin plate; terne plate	18,041	22,276	136,121	125,099
Structural shapes, plain material	31,268	19,356	145,866	89,873
Structural material, fabricated	7,363	9,406	54,671	40,226
Steel rails	7,389	12,483	85,566	109,124
Rail fastenings, switches, frogs, etc.	3,223	1,998	17,047	27,574
Boiler tubes	1,286	1,401	9,560	8,358
Casing and oil-line pipe	8,509	10,144	72,974	54,443
Black and galvanized welded pipe	12,572	10,424	68,784	53,901
Malleable iron screwed pipe fittings	1,143	917	6,291	4,411
Plain wire	3,789	4,657	26,137	23,673
Barbed wire and woven wire fencing	6,395	7,000	35,688	38,426
Wire cloth and screening	150	169	912	849
Wire rope	738	430	3,922	2,578
Wire nails	952	1,300	7,958	8,607
Other nails and tacks	928	1,091	5,349	5,258
Horseshoes	45	26	183	205
Bolts, nuts, rivets and washers, except track	1,206	1,281	8,127	6,500
Rolled and finished steel	*171,958*	*170,308*	*1,148,812*	*951,555*
Cast iron pipe and fittings	3,417	3,099	17,095	17,360
Car wheels and axles	1,448	1,702	12,467	7,624
Iron castings	815	1,307	7,079	6,937
Steel castings	1,239	812	6,299	5,240
Forgings	663	1,295	7,213	4,972
Castings and forgings	*7,582*	*8,215*	*50,153*	*42,133*
All other	1,603	1,270	9,445	6,969
Total	247,811	260,767	1,591,839	1,357,363

Decreases were reflected in June in imports of 17 of the 26 products listed while gains were made in eight when compared with May, with no incoming shipments either month of steel telegraph and telephone wire. The most important changes were in pig iron and structural shape imports, the former declining to 11,396 tons in June from 14,393 tons in May while structural shapes dropped to 12,274 tons from 14,744 tons. The gains were of minor character.

Of the 5534 tons of ferromanganese imported in June, 2620 tons came from Canada, 1261 tons from the United Kingdom, 1164 tons from Norway, 237 tons from Italy, 116 tons from France and 100 tons from Germany. Sweden supplied 1358 tons of the 3170 tons of steel bars imported, while 769 tons came from Belgium and 490 tons from France. Of the 3245 tons of hoops and bands imported, 1280 tons came from Germany, 1114 tons from Belgium and 453 tons from France.

Of the 12,274 tons of shapes imported in June, Belgium furnished 6400 tons; Germany, 4065 tons; and France, 1455 tons. France supplied 6437 tons of the 6679 tons of cast iron pipe imported during the month. Russia supplied 22,547 tons of the 51,290 tons of manganese ore concentrates imported in June, while 21,253 tons came from Brazil, 4880 tons from India and 2325 tons from Canada, according to the records of the Department of Commerce.

Exports of iron and steel in June were valued at $8,605,494, against $8,350,746 in June of last year, despite the larger quantity shipped during the earlier month. For the six months of the current year the value was $55,560,889, compared with $45,806,173 for the corresponding period of last year. Imports of iron and steel in June were valued at $787,728, against $663,458, also despite the larger shipments of last year. For the six months of 1929 the value was $4,303,909, against $3,956,450, an increase of $347,459 in value, in the face of a decline in tonnage.

UNITED STATES IMPORTS OF IRON AND STEEL PRODUCTS

(In Gross Tons)

	June	May
Austria	34	60
Belgium	9,888	13,577
Czechoslovakia	660	55
France	9,965	12,281
Germany	12,580	15,579
Italy	387	256
Netherlands	....	3,066
Norway	3,677	291
Sweden	3,835	3,927
Poland and Danzig	1,629	....
Switzerland	3	59
United Kingdom	5,790	9,517
Europe	48,448	58,668
Canada	10,042	10,982
Mexico	39	32
Cuba	1,200	....
British India	3,903	4,314
British Malaya	....	275
China, Japan, etc.	3	1
Total	63,635	74,272

Steel Furniture Orders Decline in June

WASHINGTON, July 30.—Orders for steel furniture in the "business group" in June were valued at $2,530,723, as against $2,814,423 in May, according to reports received by the Department of Commerce from 34 manufacturers. Shipments totaled $2,584,539 and $2,783,992 respectively, while unfilled orders at the end of June amounted to $2,320,642, compared with $2,400,734 at the end of May. Orders and shipments for the first six months of the current year were valued at $18,062,198 and $17,994,374 respectively, against $18,592,422 and $18,078,708 respectively for the corresponding period of last year.

Orders for $949,553 worth of shelving furniture were placed in June, according to reports from 16 producers, compared with $1,120,990 in May. Shipments were valued at $910,534 and $989,120 respectively, while unfilled orders at the end of June were valued at $934,834, against $897,361 at the end of May. Orders and shipments for the first six months of the year were valued at $6,330,636 and $6,017,167 respectively.

Employment for Seventh District Little Changed

Industrial employment in the seventh federal reserve district remained practically stationary during the period May 15 to June 15, according to a statement issued by the Federal Reserve Bank of Chicago. Plants with an approximate total of 350,000 workers showed a decline of 0.1 per cent. Pay-rolls increased 0.6 per cent, a partial recovery from the decrease of 1.4 per cent reported for the previous period. In comparison with a year ago, employment was approximately 7 per cent heavier, both in the number of workers and in volume of pay-roll.

Steel Boiler Orders Smaller

WASHINGTON, July 30.—Orders for 1685 steel boilers, with a total of 1,822,799 sq. ft., were placed in June, against 1751 with 2,144,607 sq. ft. in May, according to reports to the Department of Commerce by 80 manufacturers. For the first six months of the year, orders totaled 8725 boilers, with 9,743,852 sq. ft., compared with 9167 boilers, with 8,534,985 sq. ft. for the corresponding period of last year.

Net earnings in the first half of 1929 for the Foote-Burt Co., manufacturer of drilling and boring machinery, Cleveland, amounted to $241,711 after all charges. This was equal to $2.48 a common share. Earnings in the first half of 1928 were $320,632.

Hamilton Bridge Co. to Build Toronto Plant

TORONTO, ONT.—The Hamilton Bridge Co., Hamilton, Ont., has acquired a site on the waterfront from the Toronto Harbor Commissioners and will erect there a structural steel plant at a cost of about $350,000.

At the proposed plant the company can receive steel shipments by water. It is reported to be the company's plan to bring steel by boat from Chicago through the Welland Canal.

Chrome-Plated Aluminum On Market

Chromium plating of aluminum, by a process discovered by Harry F. Gardner, formerly of the United States Bureau of Standards, is now being done commercially by the Perma-Chrome Process Corporation in Cleveland. It is reported that all varieties of aluminum objects, such as castings, stampings and flat sheets, have been successfully plated in quantity.

A bare aluminum sheet which had scleroscope hardness of 7, tested 16 points hard after plating. The new surface is said to remain bright after long exposure to boiling water, fruit juices, and the various organic liquids formed during cooking, and which rapidly tarnish pure aluminum. It is also anticipated that the added hardness will be useful to improve gas engine pistons and other parts which must resist wear; it may also solve the problem of atmospheric corrosion of aircraft parts.

The officers of the Perma-Chrome Process Corporation are J. V. Whitbeck, president, Clyde Morgan, vice-president, William Chandler, general manager and J. I. Krall, secretary and treasurer.

Shippers to Be Consulted in Designing Cars

A plan to allow shippers a voice in specifying the design of freight cars to be purchased by railroads has been proposed by the Allegheny Regional Advisory Board, a group made up of representatives of carriers in the Pittsburgh and nearby districts. The plan proposes that, in the interests of maximum efficiency, economy and safety, designs for all kinds of new car equipment be submitted to expected users for suggestions and approval.

Metal Bases for Plaster

Expanded metal lath, woven wire and other forms of metallic backing, for use as a support for plaster or stucco in construction work, form the subject of United States Government Master Specification No. 553, issued by the Bureau of Standards. The seven-page pamphlet gives details of the standard sizes adopted for these purposes.

Nearly 50 Millions in Machinery

Exports in June Gain Over May—Half-Year Was 27½ Per Cent Ahead of 1928—Imports Higher

WASHINGTON, July 26.—Reflecting an increase of $1,646,667, exports of machinery of all kinds from the United States in June were valued at $49,732,282, compared with $48,085,615 in May. Meanwhile a gain of $6,649,355 was made over exports for June of last year, when the value was $43,082,927.

For the six months of 1929, exports of machinery were valued at $305,209,299, an increase of $65,459,783 over exports for the corresponding period of last year, valued at $239,749,516. Exports of machinery and all vehicles in June were valued at $104,994,973, against $89,925,919 in June of last year; for the six months they were valued at $671,818,336, compared with $508,139,793 for the corresponding period of 1928.

Exports of industrial machinery, as classified by the Division of Statistics, Department of Commerce, were valued at $22,392,023 in June, against $22,158,220 in May, an increase of $233,803. In June of last year they were valued at $19,877,543. For the six months ended with June they were valued at $138,446,882, compared with $108,356,700 for the corresponding period of last year.

Exports of power-driven metal-working machinery, as listed in THE IRON AGE table, totaled 886 units, valued at $1,537,399, against 812, valued at $1,173,198, in May. Exports of agricultural machinery and implements in June were valued at $12,041,000, against $10,295,000 in June of last year. For the six months they were valued at $72,068,000, compared with $54,012,000 for the corresponding period of last year.

Imports of machinery and vehicles in June were valued at $3,714,910, against $4,059,694 in May and $2,530,218 in June of last year. For the six months of 1929 they were valued at $21,860,050, an increase of $7,927,897 over imports for the first six months of 1928, valued at $13,932,153.

Imports of machinery as listed in THE IRON AGE table were valued at $2,609,261 in June, against $3,191,787 in May and $1,904,697 in June of last year. For the first six months of the present year they were valued at $16,414,371 as compared with $10,290,973 for the corresponding period of last year, an increase of $6,123,398.

Imports of industrial, office and printing machinery in June were valued at $2,111,168, against $2,213,314 in May and $1,745,976 in June of last year. For the first six months of 1929 they were valued at $12,487,534, an increase of $4,056,754 over incoming shipments for the corresponding period of last year, valued at $8,430,780.

Approximately 135 large business corporations now own airplanes for the use of their salesmen, executives and for the transportation of parts, supplies, and other services, the Ryan Aircraft Corporation, St. Louis, has found after making a survey of the rapidly increasing use of the airplane by business interests. Four, six and eight-place cabin planes, powered with a single motor, are the common types.

Machinery Exports from the United States

(By Value, in Thousands of Dollars)

	June		Six Months Ended June	
	1929	1928	1929	1928
Locomotives	$159	$142	$934	$1,025
Other steam engines	66	97	471	549
Boilers	152	129	918	582
Accessories and parts	169	34	503	335
Automobile engines	849	1,117	7,747	7,993
Other internal combustion engines	549	1,071	5,034	4,311
Accessories and parts	302	378	2,363	1,950
Electric locomotives	28	85	342	1,034
Other electric machinery and apparatus	894	626	6,680	3,801
Excavating machinery	567	485	4,143	4,009
Concrete mixers	95	66	719	511
Road-making machinery	393	313	1,821	1,502
Elevators and elevator machinery	461	372	2,578	2,147
Mining and quarrying mach'ry	1,384	1,358	8,363	6,913
Oil well machinery	1,956	1,174	12,881	6,809
Pumps	940	688	6,125	3,873
Bending and power presses	441	283	1,839	917
Forging machines	198	97	773	407
Machine tools*	1,517	1,478	9,343	7,372
Other metal-working machinery and parts	724	512	3,904	2,970
Textile machinery	1,024	1,165	6,988	6,830
Sewing machines	843	771	5,186	4,472
Shoe machinery	124	173	1,060	947
Flour-mill and gristmill machinery	38	25	303	231
Sugar-mill machinery	343	280	1,471	2,160
Paper and pulp mill mach'ry	370	199	1,608	1,704
Sawmill machinery	74	73	468	458
Other woodworking mach'ry	187	152	1,158	916
Refrigerating and ice-making machinery	1,310	980	7,339	4,650
Air compressors	590	770	3,840	3,474
Typewriters	2,032	1,885	12,209	11,682
Power laundry machinery	146	103	993	585
Typesetting machines	417	375	3,082	2,268
Printing presses	669	410	3,866	3,051
Agricultural machinery and implements	12,041	10,295	72,068	54,012
All other machinery and parts	17,685	14,922	106,098	83,300
Total	$49,732	$43,083	$305,209	$239,750

*Principal details in another table.

Exports of Power-Driven Metal-Working Machinery

	June, 1929		May, 1928	
	No.	Value	No.	Value
Engine lathes	65	$182,174	54	$115,415
Turret lathes	34	112,281	25	84,163
Other lathes	82	155,430	105	180,531
Vertical boring mills and chucking machines	7	25,035	34	38,920
Thread-cutting and automatic screw machines	82	139,858	73	115,911
Knee and column type milling machines	32	79,526	24	64,001
Other milling machines	76	148,434	32	63,715
Gear-cutting machines	41	117,640	42	141,879
Vertical drilling machines	36	51,231	27	23,482
Radial drilling machines	9	25,024	14	48,296
Other drilling machines	81	78,314	160	36,397
Planers and shapers	79	100,262	33	50,461
External cylindrical grinding machines	44	134,868	47	95,843
Internal grinding machines	41	121,314	47	66,007
Metal-working tool-sharpening machines	177	66,008	95	48,177
Total	886	$1,537,399	812	$1,173,198

Imports of Machinery Into the United States

(By Value)

	June		Six Months Ended June	
	1929	1928	1929	1928
Metal-working machine tools	$130,271	$47,447	$619,960	$316,938
Agricultural machinery and implements	794,779	333,455	5,442,860	2,913,216
Electrical machinery and apparatus	163,077	97,611	683,363	737,540
Other power-generating machinery	164,367	12,276	653,332	84,828
Other industrial machinery	888,678	1,163,176	6,366,592	4,810,835
Vehicles, except agricultural	468,089	250,732	2,638,264	1,427,616
Total	$2,609,261	$1,904,697	$16,414,371	$10,290,973

Machinery Markets and News of the Works

Sales and Inquiries Large

Machine Tool Builders Report No Improvement in Deliveries —Outlook for August Favorable

THERE was increasing evidence the past week that machine tool buying is not likely to feel the usual unfavorable effect of hot weather and of the vacation season.

Sales were well sustained and inquiries were on a sufficiently large scale to suggest that August may bring even better bookings than July, which have been surprisingly good.

It is not strange, under the circumstances, that machine tool builders report no improvement in deliveries, which in some cases run into November, December and the early months of next year. Recognizing the serious delays in deliveries at present, the Pratt & Whitney Co. has placed orders for about $200,000 worth of tools, including 10 universal turret lathes, for the new plant of the Pratt & Whitney Aircraft Corporation, although this plant is not expected to be ready to operate until next January or February.

The General Electric Co. has closed for two turret lathes, seven engine lathes and a number of presses for its electric refrigerator department at Schenectady, N. Y., and will buy additional equipment soon. Kearney & Trecker Corporation, Milwaukee, has recently expended about $150,000 for tools for a plant addition.

In the Chicago district, dealers are quoting against a list for the International Harvester Co. which ultimately will call for $1,500,000 worth of machine tools. The list already put out totals about $150,000.

An inquiry for 30 lathes for delivery to Russia has appeared, but otherwise the foreign market is without feature.

New York

NEW YORK, July 30.—Following a slight recession in machine tool buying, business is again at the former high level. It is suggested by some sellers that there may be postponements of buying until after the machine tool exhibit in Cleveland the week of Sept. 30, but it is also pointed out that with the possible exception of lathes, deliveries are at present rather extended, in some cases being well into November, and buyers may not be inclined to delay.

The General Electric Co., Schenectady, continues an active buyer for its electric refrigerator department. It has closed on part of its list of 30 tools for that division, including two of a total of five turret lathes, seven engine lathes and a number of presses. In the past week it has inquired for additional engine and turret lathes and bench milling machines.

A recent outstanding purchase was made by the Pratt & Whitney Co., Hartford, Conn., for the Pratt & Whitney Aircraft Corporation, which is building a new plant. The list, including 10 universal turrent lathes, reached a total of about $200,000 and is expected to be followed by further sizable orders. In addition to large lot buying, there is a considerable volume of single tool business to replace obsolete equipment. In the past week, the Erie Railroad has inquired for a 36-in. shaper and the New York Central for a 54-in. boring mill.

Plans have been filed by Keller Mechanical Engineering Co., 70 Washington Street, Brooklyn, manufacturer of die-cutting machinery, etc., for one-story plant, 180 x 300 ft., at Belleville, N. J., with one-story office adjoining, 50 x 120 ft., to cost about $100,000 with equipment. It is understood that present works will be removed to new location and capacity increased. Fletcher-Thompson, Inc., 738 Broad Street, Newark, N. J., is architect and engineer.

Hugo E. Magnuson, 420 Lexington Avenue, New York, architect, has plans for a two-story automobile service, repair and garage building at Brooklyn, to cost about $100,000 with equipment.

Cerro de Pasco Copper Corporation, 44 Wall Street, New York, has plans for expansion and improvements at properties near Kingman, Ariz., including two new concentrating mills, electrolytic zinc plant, tramway system, power plant and other units, to cost more than $10,000,000 with equipment.

Nassau & Suffolk Lighting Co., Island Park, N. Y., has arranged for increase in capital from $6,500,000 to $10,000,000, part of fund to be used for expansion in electric light and power properties.

Anaconda Wire & Cable Co., subsidiary of Anaconda Copper Mining Co., 25 Broadway, New York, has work under way on expansion at wire mill at Hastings, N. Y., to include installation of considerable additional equipment to cost over $1,500,000. Company will also carry out similar development at Sycamore, Ill., Anderson, Ind., and Muskegon, Wis., to cost over $750,000 with equipment.

Aero Supply Mfg. Co., College Point, L. I., manufacturer of aircraft apparatus, parts, etc., has plans for one-story unit, 50 x 140 ft., to cost about $35,000 with equipment. Peter M. Coco, 433 Steinway Avenue, Long Island City, is architect.

Cutler-Hammer Mfg. Co., Milwaukee, manufacturer of electric control devices, switches, etc., is reported planning Eastern branch plant near New York, initial unit to cost over $500,000 with equipment.

Irving Kudroff, 15 West Thirty-eighth Street, New York, architect, has plans for a six-story automobile service, repair and garage building, to cost about $130,000 with equipment.

Leonard K. Madden, 9 First Street, Troy, N. Y., and associates have organized Electric Master Machine Co., with capital of $200,000, and will operate local plant for production of special machinery and parts. William C. Ratz, 916 Jacob Street, is interested in new organization.

Westinghouse Lamp Works, Inc., Bloomfield, N. J., a subsidiary of Westinghouse Electric & Mfg. Co., 150 Broadway, New York, has awarded general contract to White Construction Co., 95 Madison Avenue, New York, for two additions, five and four stories, 50 x 100 ft., and 50 x 200 ft., to cost over $650,000 with equipment.

Tung-Sol Lamp Works, Inc., 95 Eighth Avenue, Newark, manufacturer of radio tubes and equipment, will soon break ground for an addition, totaling about 82,000 sq. ft. floor space, to cost more than $200,000 with equipment.

Board of Chosen Freeholders, Court House, Hackensack, N. J., will take bids at once for one-story power plant at Bergen Pines, Oradell, to cost $125,000 with equipment. Henry R. Kent & Co., 5 Erie Avenue, Rutherford, N. J., are engineers.

Sonoco Products Co., 95 Boyd Avenue, Jersey City, N. J., manufacturer of cardboard tubing, fiber spools and kindred products, has taken over former plant of American Motor Co., Grant Avenue, Plainfield, N. J., where it will concentrate production. Factory at Jersey City is being removed to new location and capacity will be increased.

Guilbert & Betelle, 24 Branford Place, Newark, architects, have plans for a power plant at Hillside, N. J., for company whose name is temporarily withheld, to cost more than $45,000 with equipment.

Officials of Sonatron Tube Co., 57-59 State Street, Newark, manufacturer of radio tubes and equipment, are organizing new company, to take over present organization, as well as Televocal Corpo-

ration, 588 Twelfth Street, West New York, N. J., and Magnatron Corporation, 406 Jefferson Street, Hoboken, N. J., both manufacturers of similar apparatus. Companies will be consolidated and expansion carried out. Sonatron company has plans for a six-story addition, 67 x 120 ft., to cost about $125,000 with equipment, for which Siegler & Greenberg, 164 Market Street, are architects.

North Jersey District Water Supply Commission, 24 Commerce Street, Newark, will soon take bids for electric motors, switchboards and other electric power equipment, to cost about $100,000, and for pumping machinery to cost about $50,000, for Wanaque aqueduct project.

Reliance Steel Products Co., 43-49 Ralph Street, Bellville, N. J., has been recently incorporated with capital of $125,000 to manufacture screw products.

Marval Pump & Engineering Co., Inc., New York, will manufacture on contract 50 to 1500 gal. per min. bronze rotary pumps for fire and industrial purposes.

American Machinery Supply Corporation, 24-26 Mechanic Street, Newark, N. J., has been formed to deal in new and used tools. Charles J. McPhillips is president and Paul Kifner secretary-treasurer.

South Atlantic

BALTIMORE, July 26.—Contract has been let by Black & Decker Mfg. Co., Pennsylvania Avenue, Towson, Baltimore, manufacturer of portable electric tools, etc., to William H. Sands, Towson, for two-story addition to cost about $140,000 with equipment. George N. Mackenzie, 3d., 5 North Guilford Avenue, Baltimore, is architect.

Wyatt & Nolting, Keyser Building, Baltimore, architects, have plans for two and six-story automobile service repair and garage building, to cost about $900,000 with equipment.

Tennessee Mineral Products Co., Spruce Pine, N. C., a unit of United Feldspar Corporation, 10 East Fortieth Street, New York, is said to be planning extensions in local properties and will install machinery for feldspar production in two mines, including hoisting, conveying and other handling equipment.

Duke Power Co., Charlotte, N. C., operating electric light and power properties in North and South Carolina, has arranged for an increase in capital from $100,000,000 to $150,000,000, part of fund to be used for extensions and improvements.

Reid-Avery Co., Cleveland and Chesapeake Avenues, St. Helena, Baltimore, manufacturer of oxy-acetylene and electric welding rods, electrodes, etc., has approved plans for a one-story addition, 50 x 210 ft., to cost about $30,000 with equipment.

Standard Wholesale Phosphate Co., Continental Building, Baltimore, has plans for a new one-story unit, 120 x 300 ft., at Williamston, N. C., to cost over $90,000 with machinery. C. G. Crockett is plant manager in charge.

Cunliffe-Cadillac Co., Baltimore, local representative for Cadillac automobile, has leased multi-story building to be erected at Charles and Twenty-fourth Streets, for which general contract has been let to North Eastern Construction Co., 6 West Madison Street, for a new service, repair and sales building, to cost $150,000 with equipment. Howard Baldwin, 339 St. Paul Street, is architect.

Claude Neon Virginia Corporation, Richmond, Va., has been formed by Baltimore interests, headed by Norman A. Hill, 12 Clay Street, Baltimore, with capital of $75,000 and 2500 shares of stock, and plans establishment of plant at Richmond to manufacture electric lighting equipment, displays, etc., under Claude Neon patents. New company is represented by William H. Hudgins, 213 St. Paul Street, Baltimore.

City Council, High Point, N. C., has plans for a municipal electric light and power house, to cost over $75,000 with equipment. William C. Olsen, Exchange Place, Raleigh, N. C., is consulting engineer.

The Crane Market

INQUIRY for electric overhead cranes has slackened considerably and award of pending business is somewhat delayed by the vacation season. An outstanding list of overhead cranes recently issued, calls for six 30-ton electric cranes for substations of the Board of Transportation, New York. The inquiry is from the General Electric Co., Schenectady, N. Y., and the Westinghouse Electric & Mfg. Co., Pittsburgh. There are two more lists of overhead equipment pending, which have been in the market for some weeks. Builders are well booked with business, following one of the best six-month periods since the armistice, and it is noteworthy that dealers in used overhead cranes are actively seeking equipment to supply an increased demand. Locomotive crane business is light, but there is a fair volume of pending business, especially from contractors.

Among recent purchases are:

Goldsmith Brothers Smelting & Refining Co., Chicago, 3-ton, 40-ft. span, electric traveling crane from Northern Engineering Works.

Philadelphia

PHILADELPHIA, July 29.—Bids are being asked on general contract by Atwater Kent Mfg. Co., Philadelphia, until Aug. 6 for one-story, sawtooth roof addition, totaling 450,000 sq. ft., to cost $1,200,000 with equipment. Company has broken ground for four-story power plant, to cost $200,000 with machinery. Ballinger Co., Twelfth and Chestnut Streets, is architect and engineer for both structures.

Girard Smelting & Refining Co., Tioga and Richmond Streets, Philadelphia, will soon ask bids on general contract for one-story addition, to cost about $140,000 with equipment. H. B. Tobias, Otis Building, is architect.

Philadelphia & Reading Coal & Iron Co., Reading Terminal, Philadelphia, has plans for new steam-operated electric generating plant on Susquehanna River at Herndon, Pa., to utilize pulverized coal as fuel, to cost about $6,000,000 with transmission system. Application has been made for charters for 33 electric transmission companies to operate in townships in eastern part of State. Transmission lines will be constructed through different townships. A. J. Maloney is president.

W. F. Potts Son & Co., Inc., 1224 Cherry Street, Philadelphia, iron and steel products, has awarded a general contract to Fred A. Havens Co., 845 North Nineteenth Street, for one-story storage and distributing plant, to cost about $30,000. M. A. Webster, 1600 Arch Street, is architect.

Kay Steel Wheel Co., Los Angeles, manufacturer of automobile wheels, etc., has leased part of building at Delaware Avenue and South Street, Philadelphia, for Eastern factory branch and distributing plant. Company has been occupying property in this vicinity heretofore.

Grinnell Automatic Sprinkler Co., Commercial Trust Building, Philadelphia, manufacturer of fire extinguishers and equipment, has purchased property at Erie Avenue and D Street, 200 x 337 ft., for new two-story factory branch and distributing plant. It will cost over $100,000 with equipment, and will replace present plant at Seventeenth Street and Sedgley Avenue, which will be removed to new location. Main plant is at Providence, R. I.

Mechanicsburg Borough School Board, Locust and Arch Streets, Mechanicsburg, Pa., is said to be planning installation of manual training equipment in new two-story high school addition to cost about $185,000, for which bids will be asked on general contract early in August. C. J. Lappley, Front and Harris Streets, Harrisburg, Pa., is architect.

Louis Sylvester, president, and other officials of Scranton Button Co., Scranton, Pa., are organizing American Record Co., to take over and consolidate company noted with Cameo Record Corporation, 114 East Thirty-second Street, and Regal Record Co., 10 West Twentieth Street, New York. New company will have assets estimated at $8,000,000 and will specialize in production of talking machine records; plant of Scranton company will be developed as primary manufacturing works and increased facilities will be provided. Mr. Sylvester will head consolidated organization.

Bro-Dun Metal Products Co., North West End Avenue and McKinley Street, Lancaster, Pa., has been organized by Jerome S. Dunie and Edgar P. Brock, 1045 Woods Avenue, with capital of $25,000, to operate local foundry for production of brass, bronze, aluminum and other castings.

Sylvania Products Co., Emporium, Pa., manufacturer of radio tubes and equipment, is establishing branch factory at Lock Haven, Pa., for production of new screen grid-type tube and affiliated specialties.

New England

BOSTON, July 29.—Some local machine tool dealers did a good business the past week, planers, shapers, radial drills and lathes being in most active demand. Fully 90 per cent of tools sold were for 1930 delivery. Sales of some types of equipment undoubtedly are restricted because of deferred deliveries. Business in used tools is confined to small and unimportant equipment.

Machine tool prices tend upward; press brakes are higher, as well as planers and shapers.

July sales of small tools probably will exceed those of the corresponding month last year, and June this year.

Harry Katz, 525 Park Street, Hartford, Conn., has plans for an automobile body and radiator repair shop. Welding equipment is under consideration.

L. W. Bills, 73 Hancock Street, Lexington, Mass., has started work on a two-story, 24 x 42 ft., machine shop, to cost $15,000 without equipment.

Reed & Prince Mfg. Co., Duncan Avenue,

Worcester, Mass., is erecting a two-story addition, 106 x 209 ft.

Yale & Towne Mfg. Co., Stamford, Conn., has awarded a contract for a one-story foundry addition, 100 x 150 ft. A new furnace will be installed.

New Britain-Gridley Machine Co., 140 Chestnut Street, New Britain, Conn., is making alterations to its plant. Conveying equipment will probably be required.

New Britain Machine Co., South Street, New Britain, Conn., machine tools, has started work on a one-story addition, 24 x 260 ft.

Westinghouse Electric & Mfg. Co., East Springfied, Mass., is building a one-story foundry addition, 30 x 80 ft.

American Coal & Charcoal Co., 55 Derby St., Salem, Mass., has plans for coal pocket, 45 x 80 ft., for which conveying equipment is needed.

Morgan Brass Foundry, Lincoln Avenue, Providence, R. I., destroyed by fire last week, has plans for a new plant. Hoisting equipment, furnaces and general brass foundry equipment will be needed.

Thomas Smith & Co., 288 Grove Street, Worcester, Mass., metal punches and bolts, have started work on a one-story addition, 56 x 58 ft.

Contract has been let by Vanadium Metals Co., Boston Post Road, Groton, Conn., to H. R. Douglas & Son, Barrows Building, New London, Conn., for one-story foundry, 50 x 124 ft., to cost about $40,000 with equipment.

Bassick Co., Austin Street, Bridgeport, Conn., manufacturer of casters, metal furniture trimmings, etc., is said to be planning one-story addition, to cost about $45,000 with equipment.

Wright & Corson Co., Bridgeport, Conn., manufacturer of rivets, machine screws and kindred products, has work under way on removal of equipment from local plant to new factory at Milford, Conn., recently completed, and will concentrate production at latter place in future. New plant will represent investment of about $500,000.

New Departure Mfg. Co., Bristol, Conn., manufacturer of ball bearings, has awarded general contract to Aberthaw Co., Boston, for one-story forge shop extension, 50 x 82 ft., to cost over $40,000 with equipment.

Agawam Airport, Inc., Agawam, Mass., operated by H. L. Bowles, Springfield, Mass., and associates, has authorized construction of hangar with repair and reconditioning shop, to cost about $90,000 with equipment.

C. J. Cox Engineering Co., 625 Putnam Avenue, Cambridge, Mass., manufacturer of mechanical specialties, has awarded general contract to C. J. Pitcher, 46 Cornhill Street, Boston, for one-story shop addition and improvements in present works, to cost about $35,000.

Homer D. Bronson Co., Beacon Falls, Conn., manufacturer of sheet metal stampings, hinges and butts for automobiles, cabinets, etc., has awarded general contract to Oscar Lacroix Construction Co., Waterbury, Conn., for one-story addition, 35 x 100 ft., to cost about $40,000 with equipment. W. E. Hunt, Torrington, Conn., is architect.

Dewey & Almy Chemical Co., 235 Harvard Street, Cambridge, Mass., has taken out permit for one-story machine shop, to cost about $30,000 with equipment.

Chase Brass & Copper Co., Waterbury, Conn., a subsidiary of Kennecott Copper Corporation, 120 Broadway, New York, has purchased Irvine Brass & Copper Co., Minneapolis, Minn., manufacturer of kindred brass and copper products, which will be operated as branch works.

Boston & Maine Railroad Co., North Station, Boston, is razing passenger car repair shop at freight yards between Somerville and Cambridge, and will soon begin work for new engine house with repair facilities, to cost more than $1,000,000 with equipment, for which plans have been completed.

Detroit

DETROIT, July 29.—Grand Trunk Railway Co., 400 East Jefferson Street, Detroit, has plans for one-story car repair shop at Ferndale, Mich., to cost more than $45,000 with equipment. Engineering department is in charge.

Board of Trustees, University of Michigan, Ann Arbor, has plans for extensions and improvements in power house, including underground system, and will proceed with work at once, to cost over $400,000.

Bohn Aluminum & Brass Co., Joseph Campau Avenue, Detroit, has awarded general contract to Krieghoff Co., 6661 French Road, for three-story addition, primarily for manufacture of aluminum parts for aircraft, to cost $125,000 with machinery.

Evans Auto Loading Co., Inc., Dime Bank Building, Detroit, manufacturer of automobile loading devices and equipment, is arranging for a bond issue to total about $1,200,000, part of fund to be used for expansion. Company is establishing a factory branch on Pacific Coast to manufacture battery boxes and kindred specialties.

Huntington Regulator Co., Flint, Mich., manufacturer of gas regulators and other regulating devices, is said to be planning a new factory at Lansing, Mich., to cost over $45,000 with equipment. Present factory will be removed to new location and capacity increased.

Detroit Butcher Supply Co., 1455 Gratiot Avenue, Detroit, manufacturer of knives, fixtures, etc., has plans for two-story unit, to cost about $55,000 with equipment. Pollmar & Ropes, Hoffman Building, are architects.

Whitmar & Leonard, Inc., Grand Rapids, care of W. C. Whitmar, city, recently organized to manufacture gliders and other aviation equipment, is planning early operation of a local plant. Charles S. Leonard, Grand Rapids, will be an official of new company.

Clark Equipment Co., Buchanan, Mich., manufacturer of axles, wheels, transmissions and other automotive equipment, has arranged for a stock issue of $2,280,000, part of fund to be used for expansion. Negotiations are being completed for purchase of controlling interest in Frost Gear & Machine Co., Jackson, Mich., manufacturer of kindred equipment, which will be operated as a subsidiary. Company will also develop business of Clark Tructractor Co., manufacturer of gasoline-propelled industrial trucks, etc., another subsidiary. Eugene B. Clark is president.

Pontiac Redi-Mixed Corporation, Pontiac, Mich., recently formed with capital of $75,000, by W. R. Ransom and T. S. McGaughan, Pontiac, and associates, is planning construction of new concrete-mixing plant, with bins, loading equipment, etc., to cost $35,000 with machinery.

Officials of Moreland Brothers Co., Adrian, Mich., oil products, have arranged for change of name to Moreland Oil Co., and plan expansion. Company is arranging for sale of bond issue to total about $100,000, part of fund to be used for extensions.

Ford Motor Co., Detroit, has filed plans for one-story addition to aircraft manufacturing plant at Dearborn, Mich, to cost more than $100,000 with equipment.

Allied Motor Industries, Inc., has bought Wills St. Clair plant at Marysville, including 144 acres, on St. Clair River, for manufacture of airplane engines.

Ramisch Tool & Die Co., Kalamazoo, Mich., has been organized to manufacture metal dies, stampings and patterns. Purchase of equipment is contemplated.

Michigan Aero-Engine Corporation, Lansing, Mich., has been organized to manufacture Rover aviation engines. H. B. Lundberg is president and general manager.

Marine Aircraft Corporation, Detroit, has been organized as subsidiary of Detroit Aircraft Corporation, and will manufacture amphibians and flying boats. C. B. Fritsche is vice-president of the latter company.

Buffalo

BUFFALO, July 29.—National Lime, Cement & By-Products Corporation, Stock Exchange Building, Buffalo, is arranging for construction of new lime plant on site recently acquired near Tuscumbia, Ala., to cost more than $350,000 with equipment. It is expected to make machinery purchases early in fall. Autery Engineering Co., Sheffield, Ala., is in charge of surveys for plant.

Kee-Lox Mfg. Co., 10 Keelox Place, Rochester, N. Y., manufacturer of carbon and other processed papers, has awarded general contract to Werner Spitz, 11 Comfort Street, for two additions, two and three stories, to cost about $60,000 with machinery. Leander McCord, Taylor Building, is architect.

Fire, July 24, destroyed a part of storage and distributing plant of Irving Engineering Co., 74-80 Jewett Avenue, Buffalo, automobile fronts and kindred products. Plans are being considered for rebuilding.

Carborundum Co., Buffalo Avenue, Niagara Falls, N. Y., manufacturer of grinding wheels and other abrasive materials, has awarded a general contract to Laur & Mack Contracting Co., College Street and Highland Avenue, for four-story addition, to cost about $100,000 with equipment.

Acoustic Products Co., 50 West Fifty-seventh Street, New York, manufacturer of radios and equipment, has purchased Federal Telephone Mfg. Corporation, 1738 Elmwood Avenue, Buffalo, and its subsidiaries, Federal Radio Corporation and Federal Orthosonic, Ltd., and will consolidate. Purchasing company will develop Buffalo plant to maximum capacity for manufacture of radio apparatus, including cases and frames, supplementing production now being carried out at Saginaw, Mich., and will also increase manufacturing facilities at last-noted works.

Walker Lee, Jr., Powers Building, Rochester, architect, will take bids at once for automobile service, repair and garage building, to cost $100,000 with equipment.

Consolidated Packaging Machinery Corporation, 1400 West Avenue, Buffalo, has been incorporated to continue manufacture of a general line of automatic packaging machinery.

Chicago

CHICAGO, July 29.—Chicago machine tool dealers have begun to quote against the International Harvester Co.'s list which, it is said, will ultimately call for about $1,500,000 worth of machine tools. Inquiries before the trade total $150,000 for tools on which satisfactory deliveries are difficult to obtain. Kearney & Trecker Corporation, Milwaukee, has recently closed for $150,000 worth of machine tools for an addition. On the whole, business in July has been in good volume, such in fact that improvement in deliveries is of small moment.

It is reported that the Nash Motors Co. is planning for extensive replacements at its Kenosha plant. Crane Co., Chicago, which has ordered a 72-in. boring mill, will buy several radial drills and is interested in milling machines and turret lathes. Both inquiries and purchases by the railroads are of small size. Chicago Board of Education will buy a two-wheel dry grinder, an 11-in. x 4-ft. engine lathe, an 18-in. band saw and three motor-in-head lathes.

Valley Forge Steel & Tool Co., has purchased property at corner of Monroe and Jefferson Streets, Chicago, improved with six-story loft structure. It will occupy about one-third of building and will carry on a general business in tool steels and metal cutting tools.

Goodman Mfg. Co., 4834 South Halsted Street, Chicago, manufacturer of mining machinery, will build a three-story brick factory, 58 x 73-ft. L. E. Ritter, Marquette Building, is architect.

Victor X-Ray Corporation, 223 South Seeley Avenue, Chicago, will build a five-story plant addition, 101 x 126-ft. to cost $150,000. S. N. Crowen, Willoughby Tower, is architect.

Standard Perforating Co., Forty-ninth Place, Chicago, will build a factory containing 13,000 sq. ft. of floor space.

Superstructure has been begun by Monarch Aircraft Co., Rockford, Ill., for one-story plant, 120 x 140 ft., for parts production and assembling, to cost more than $85,000 with equipment.

Englewood Desk Co., Inc., 5820 Lowe Avenue, Chicago, has awarded general contract to Charles Magnuson, 7431 Merrill Avenue, for rebuilding part of two-story plant recently destroyed by fire, to cost about $40,000 with equipment.

Economy Machine Products Co., 5206-14 Lawrence Avenue, Chicago, has awarded a general contract to Chicago Industrial Construction Co., 53 West Jackson Boulevard, for one-story addition, 60 x 90 ft., to cost about $30,000 with equipment. J. M. Brandstetter, 2001 West Pershing Road, is architect and engineer.

Rockford Drop Forge Co., Rockford, Ill., will soon begin work on one-story addition, 85 x 275 ft., with extension 60 x 72 ft., to cost about $150,000 with equipment. Lockwood Greene Engineers, Inc., 400 North Michigan Avenue, Chicago, is architect and engineer.

Minnesota Mining & Mfg. Co., Forest and Fauquier Streets, St. Paul, Minn., manufacturer of abrasive materials, mining specialties, etc., has awarded a general contract to William M. Murphy & Son, Pioneer Building, for two-story and basement addition, to cost about $150,000 with equipment. Toltz, King & Day, Inc., Builders' Exchange Building, is architect and engineer.

Scully Steel & Iron Co., 203 South La Salle Street, Chicago, has asked bids on general contract for one-story storage and distributing plant, to cost about $40,000 with equipment.

K-B Auto-Radio Laboratories, Inc., Chicago, has leased factory at 2925 Calumet Avenue, totaling about 15,000 sq. ft. floor space, for manufacture of radio equipment and devices.

Board of Education, Pueblo, Colo., is said to be planning installation of manual training equipment in central junior high school addition at Broadway and Orman Streets, to cost $130,000, for which superstructure will soon begin. Walter DeMordaunt, First National Bank Building, is architect.

Continental Grain Co., Chamber of Commerce, Minneapolis, Minn., has filed plans for new grain elevator on Twenty-fifth Avenue, S. E., to include elevating, conveying, screening and other equipment, to cost about $100,000. A. B. Marcy is secretary.

Pittsburgh

PITTSBURGH, July 29.—The machinery trade has not shown marked activity the past week, but July sales with most dealers in this district appear close to the June level, and unusually high for a mid-summer month. A large part of the business of local agents is for replacement parts and repairs, as equipment in plants has been taxed to the utmost in recent months, and in some cases companies have postponed placing new tools until production capacity is not being utilized so highly. For this reason many dealers expect the machine tool business to remain active for some time.

Westinghouse Electric & Mfg. Co. has not begun to place the bulk of tools on its third quarter list and no action has been taken on equipment for the new plant of the Aluminum Co. of America at New Kensington, Pa. Otherwise prospective inquiry of outstanding size is light, but requirements of the large steel mill expansion projects in this district are furnishing local dealers with plenty of figuring.

Plans are being drawn by Reliance Steel Castings Co., Twenty-eighth and Smallman Streets, Pittsburgh, for one-story foundry addition, to cost about $55,000 with equipment. Lake & Davidson, 6200 Penn Avenue, are architects.

Iron City Tool Works, Inc., Pittsburgh, has been formed with capital of $50,000, to take over and expand company of same name with plant at 3201 Smallman Street, specializing in manufacture of tools and implements, steel shapes, etc.

Penn Airplane Co., Sharon, Pa., is considering rebuilding part of assembling plant destroyed by fire June 20.

E. I. duPont deNemours & Co., Wilmington, Del., has approved plans for addition to electric generating plant at branch nitrogen works at Belle, W. Va., to cost more than $100,000 with equipment.

Hancock Mfg. Co., New Cumberland, W. Va., recently organized, has work in progress on new mill for production of steel stampings, and will increase size, as originally planned, from 30 x 208 ft. to 70 x 208 ft., to cost about $80,000 with equipment.

Pennsylvania Power Co., Sharon, Pa., has plans for two-story equipment storage and distributing plant, with repair shop, to cost $100,000 with equipment. Stevens & Wood, Inc., 20 Pine Street, New York, is engineer. Company is a subsidiary of Pennsylvania-Ohio Edison Co., Youngstown.

Indiana

INDIANAPOLIS, July 29.—Contract has been let by Edwards Iron Works, Inc., South Bend, to C. A. Jordan Co., 725 Wilbur Street, for one-story storage and distributing plant, to cost about $45,000 with equipment.

Board of School Trustees, Monroe City, has authorized installation of manual training department in new two-story and basement high and grade school, to cost about $115,000, for which bids will soon be asked on general contract by John Bayard, 231 Main Street, Vincennes, architect.

Mal-Gra Castings Co., Cambridge City, manufacturer of malleable castings, is planning to rebuild part of foundry destroyed by fire July 18.

Arthur Church, 231 East River Street, Peru, architect, has plans for a one and three-story automobile service, repair and garage building, 135 x 145 ft., to cost about $100,000 with equipment.

General Outdoor Advertising Co., 120 West Maryland Street, Indianapolis, manufacturer of displays, signs, etc., is planning erection of new plant on property recently secured under lease, to cost more than $70,000 with equipment. Present works will be removed to new location on completion of building, scheduled in October.

J. D. Adams Mfg. Co., 217 South Belmont Avenue, Indianapolis, manufacturer of road-building machinery and equipment, has plans for new factory branch and distributing plant at Dallas, Tex., to cost close to $40,000 with equipment. Erection will be in charge of H. P. Inge, Republic Bank Building, Dallas.

Cleveland

CLEVELAND, July 29.—Plans are under way by Willard Storage Battery Co., East 131st Street and St. Clair Avenue, Cleveland, for new plant at Los Angeles for initial output of 2000 electric storage battery units daily, to cost about $1,000,000 with machinery.

Spaulding Fibre Co., 124 St. Clair Avenue, Cleveland, manufacturer of sheets, rods, tubes, etc., has plans for a one-story plant unit, 100 x 100 ft., to cost over $60,000 with equipment. McGarry & McGarry, 241 Euclid Avenue, are architects. Headquarters of company are at Tonawanda, N. Y.

Plibrico Jointless Firebrick Co., 1840 Kingsbury Avenue, Chicago, has acquired plants and properties of Portsmouth Refractories Co., Portsmouth, Ohio, including refractory plant at Firebrick, Ohio, and about 1200 acres of raw material lands in Lawrence and Scioto Counties. Extensions and improvements will be made, including installation of mechanical drying and weathering system; part of works will be developed for calcining flint clay for refractory furnace linings.

Hercules Motors Corporation, Canton, Ohio, manufacturer of gasoline engines for motor buses, trucks, etc., has disposed of stock issue to total $4,500,000, part of proceeds to be used for expansion.

General Fireproofing Co., Youngstown, Ohio, has awarded general contract to Rust Engineering Co., Koppers Building, Pittsburgh, for four-story addition totaling 90,000 sq. ft. floor space, for production of aluminum chairs, to cost $250,000 with machinery.

Automobile Service Corporation of America, Inc., care of Shattuck & Layer, 134 North La Salle Street, Chicago, archi-

tects, has plans for an automobile service, repair and garage at Cleveland, consisting of three units, each one story, 30 x 256 ft., 30 x 120 ft., and 110 x 115 ft., to cost over $100,000 with equipment.

Middle States Air Service, Inc., care of C. W. Frank, Akron Savings & Loan Building, Akron, Ohio, architect, has plans for a hangar with shop and repair facilities at local airport, to cost about $150,000 with equipment. It is expected to ask bids on general contract in August.

Cleveland Chain & Mfg. Co., Cleveland, is erecting an addition to care for increased business. L. D. Round is president.

Lincoln Electric Co., Cleveland, has awarded contract to Austin Co. for an all-welded warehouse, 68 x 200 ft., to cost $65,000.

Cincinnati

CINCINNATI, July 29.—Although a slight letup in the volume of fresh booking is noticed by machine tool builders in this district, new business on the whole is good for this season of the year and better than during the same period, last year. Production is being sustained at an unusually high level for midsummer. Although there is a recession in the call for specialty tools, this is offset by the constant inquiry for one or two standard machines and a widening source of demand.

While action is being awaited on two previous inquiries from Russian commissions, which passed some time inspecting plants in this district, a third request for quotations has been received. This is for 30 lathes of all sizes and types.

Board of Education, Cincinnati, plans installation of manual training department in new school on Victory Boulevard, to cost $1,000,000, for which bids will be asked on general contract in August. Garber & Woodward, 4 West Seventh Street, are architects.

Texas Corporation, 524 Walnut Street, Cincinnati, headquarters at Houston, Tex., has plans for an oil storage and distributing plant, to cost about $50,000 with equipment.

Hobart Mfg. Co., Troy, Ohio, manufacturer of meat choppers and kindred products, has plans for a one-story addition, to cost about $20,000 with equipment.

E. R. McKenzie, 2432 Parkway Place, Memphis, Tenn., and associates have organized Machine Mfg. & Supply Co., with capital of $100,000, and plans early operation of local plant for production of mechanical specialities.

Hart Mfg. Co., 1600 North Western Parkway, Louisville, manufacturer of furnaces, castings, etc., plans rebuilding part plant destroyed by fire July 20.

Knoxville Iron Co., Knoxville, Tenn., has work under way on expansion program, including installation of additional machinery, to cost more than $150,000.

Commerce Garage Co., 321 Race Street, Cincinnati, will take bids in August for seven-story service, repair and garage building, 60 x 200 ft., to cost $450,000 with equipment. Hillsmith & Co., Chamber of Commerce Building, are architects and engineers.

Reynolds Metal Co., Louisville, is said to be planning call for bids on general contract about middle of August for initial unit of plant on Bell's Lane, three-stories, to cost $150,000 with equipment. Arthur G. Tafel, 142 South Third Street, is architect. Company is affiliated with United States Foil Co., Louisville.

Milwaukee

MILWAUKEE, July 26.—Practically no recession has taken place in the machine tool trade, manufacturers reporting good flow of orders and inquiries. Automobile plants have reduced production, and wood-working factories are experiencing a depression in almost all lines except that of radio cabinet manufacture. Deliveries have improved on some items, but not on special equipment or milling machines. Inquiries forecast a brisk fall season.

Preferred stock of National Gauge & Equipment Co., LaCrosse, Wis., has been acquired by Moto-Meter Gauge & Equipment Co., division of Moto-Meter Corporation, Long Island City, N. Y., following purchase last fall of all common stock by Moto-Meter interests. LaCrosse plant will be remodeled and an adjoining building will also be occupied for manufacturing. Equipment for vitreous enameling is being added.

Milwaukee Circulating Pump & Mfg. Co., 331 Ninth Street, Milwaukee, maker of forced water equipment for internal combustion engines, has changed its name to Hein-Werner Motor Parts Corporation, following a reorganization in which S. A. Perkins, secretary-treasurer of Waukesha Motor Co. acquired large holdings. Plant and offices of Hein-Werner corporation will be moved to Waukesha, where a two-story plant, 175 x 300 ft. will be erected at a cost of about $200,000. Machinery in Milwaukee plant will be moved to Waukesha.

Unit Corporation of America, 5301 Burnham Street, Milwaukee, specializing in manufacture of gears, transmissions and other automotive specialties, have started work on new building, 100 x 225 ft., for Universal Power Shovel division of company. It will cost $125,000 with equipment.

Liberty Foundry Co., 368 State Street, Wauwautosa, Milwaukee County, Wis., is about to contract for an addition, 26-ft. high with floor area of 27,350 sq. ft.

Wisconsin-Timken Axle Co., High Street, Oshkosh, Wis., is erecting two additions, 40 x 40 ft., and 24 x 30 ft.

Bell Machine Co., Oshkosh, Wis., maker of woodworking machinery, has begun construction of 2-story addition, 50 x 85 ft., to cost about $35,000 with machinery.

City of Kiel, Wis., has retained W. G. Kirchhiffer, Madison, Wis., consulting engineer, to design additions for water supply system, including one 750-gal. and one 300-gal. pumps, air lift pump, air compressor and an extra reservoir. Theodore Brill is city clerk.

St. Louis

ST. LOUIS, July 29.—Contract has been let by Beacon Airways of America, Inc., Board of Trade Building, Kansas City, Mo., to J. F. Gier, 410 East Fifty-fourth Street, for one-story plant, 60 x 155 ft., to manufacture aircraft, to cost about $100,000 with equipment. Clarence E. Shepard, Huntzinger Building, is architect.

Mallinckrodt Chemical Works, Inc., 3600 North Second Street, St. Louis, has awarded general contract to Woerman Construction Co., Syndicate Trust Building, for a power house, to cost about $80,000 with equipment.

City Council, Oklahoma City, Okla., is arranging fund of $435,000 for extensions in municipal airport, including hangars, repair and reconditioning shops, and other buildings.

Board of Education, Coffeyville, Kan., is planning installation of manual training equipment in new high school, to cost $500,000, for which bids will soon be asked on general contract. Glenn H. Thomas, W. K. H. Building, Wichita, Kan., is architect.

Johnson-Norton Buick Agency, Oklahoma City, Okla., local representative for Buick automobiles, is considering three-story and basement service, repair and sales building, 125 x 165 ft., to cost about $120,000 with equipment.

Mid-Southern Air Terminal, Inc., Little Rock, Ark., care of William J. Blythe, Boyle Building, has taken options on property near city for airport, and plans construction of hangars, repair shops, oil storage and other buildings, to cost more than $85,000 with equipment.

Inland Waterways Corporation, Helena, Ark., E. C. Horner, head, has plans for grain elevator and transfer terminal, with elevating, conveying, screening and other equipment, to cost $130,000. W. F. Schulz, Memphis, Tenn., is engineer.

New Era Motors, Inc., care of J. E. Roberts, 17 East Forty-fifth Street, New York, organized to manufacture Ruxton automobile, an eight-cylinder, front drive car, has arranged with Gardner Motor Co., Inc., Main and Rutgers Streets, St. Louis, for initial manufacture of new automobile, and will not operate temporary plant in that city as previously announced. Both parts manufacture and assembling will be handled by Gardner company. New Era company plans erection of permanent plant at Detroit later.

Board of Education, St. Joseph, Mo., is planning installation of manual training equipment in new Garfield-Jackson high school, to cost $260,000, for which plans will be drawn by Walter B. Tootle, Lacey Bank Building, architect. William B. Ittner, 911 Locust Street, St. Louis, is associate architect.

Sunnen Products Co., manufacturer of valve grinders, valve lifters and compressors, has purchased 3½-acre site at Maplewood, Mo., a suburb of St. Louis, for erection of a plant containing about 25,000 sq. ft. of floor space, to cost $25,000.

Gulf States

BIRMINGHAM, July 29.—Plans are being completed by Standard Oil Co. of Louisiana, Baton Rouge, for extensions in local refinery, including installation of equipment for gasoline production, to cost over $5,000,000 with machinery.

Ha-Boy Metal Products Co., 1443 West Forsyth Street, Jacksonville, Fla., manufacturer of metal goods for automobiles, including all-metal ventilating shades, etc., is planning an expansion to more than double present capacity, to cost over $40,000 with equipment. William E. Boyett is head.

Southern Steel Works, Inc., 908 Lucien Avenue, Birmingham, has begun an expansion program at steel fabricating plant, to include new punch shop, cutting shop and other units, with one-story extension to beam shop, to cost over $90,000 with machinery.

Model Brass Foundry Co., 2309 Hickory Street, Dallas, Tex., has plans for exten-

sions and improvements in foundry, to cost over $25,000.

Humble Oil & Refining Co., Houston, Tex., is planning extensions in refinery at Baytown, Tex., including installation of equipment for gasoline production, to cost over $2,000,000.

Airport Committee of City Council, Brady, Tex., has authorized purchase of property on Mason Highway, about four miles from city, as site for municipal airport, and plans early construction of hangar, repair shop, oil storage and other buildings, to cost more than $65,000 with equipment.

Southern Cotton Oil Co., Sheffield, Ala., will erect a one-story addition, to cost about $45,000 with equipment.

Cranfill-Reynolds Co., Dallas, Tex., has been formed with capital of 1,000,000 shares of stock, no par value, to take over a group of oil companies, including Cranfill & Reynolds, Inc., Cisco, Tex.; Moody-Seagraves Co., Fort Worth, Tex.; Petroleum Pipe Line Co. and Central Texas Refining Co., Corsicana, Tex., as well as Cody Petroleum Co., Cody, Wis. Headquarters of consolidated organization will be at Dallas. Plans are under way for expansion in different refineries and pipe line construction. O. R. Seagraves is chairman of board of new organization.

Seaman Foundry Co., 2307 Grand Avenue, Dallas, Tex., is planning an expansion program, including installation of additional equipment for production of iron and other castings, to cost about $25,000.

American Gas & Power Co., Birmingham, operating Birmingham Electric Co., Birmingham Gas Co. and other light and power utilities, has purchased Industrial Gas Corporation, Birmingham, and will consolidate. Purchased company was formerly a subsidiary of Alabama By-Products Co. Plans are under way for expansion, including pipe line construction.

Alamo Airplane Co., Milam Building, San Antonio, Tex., has plans for one-story aircraft plant, including parts and assembling departments, to cost about $30,000 with equipment. Company will manufacture three models of airplanes to retail at popular price. Boyd Hammond is company engineer, in charge.

Pacific Coast

SAN FRANCISCO, July 25.—Contract has been let by California Corrugated Culvert Co., Fifth and Parker Streets, Berkeley, Cal., to Pacific Coast Engineering Co., Oakland, for one-story addition to cost about $25,000 with equipment. F. C. Williams, 74 New Montgomery Street, San Francisco, is architect.

Standard Auto Body Co., Fifteenth Street and Central Avenue, Los Angeles, will take bids at once for one-story addition, 100 x 150 ft., to cost about $65,000 with equipment. Richard D. King, Van Nuys Building, is architect.

Board of County Supervisors, Fresno, Cal., has plans for one-story repair shop at Fresno district fair grounds for County road equipment, to cost $25,000.

Southern California Gas Co., Los Angeles, has applied for permission to build a pipe line from Huntington Beach to San Diego, Cal., about 250 miles, with daily capacity of 50,000,000 cu. ft., to cost more than $2,500,000 with booster stations, etc.

Board of School Trustees, Rivera, Cal., has rejected bids for a one-story manual arts building at local high school, and will ask new bids later, following voting of additional appropriation. Robert H. Orr, Corporation Building, Los Angeles, is architect.

Edward Hines Western Pine Co., Burns, Ore., operated by Edward Hines Lumber Co., 2431 South Lincoln Street, Chicago, has work under way on initial units of new lumber mill at Burns, to cost more than $2,000,000 with machine shops, power house and other units. Completion is scheduled in about six months.

Oregon-Washington Railroad & Navigation Co., Portland, will soon begin an addition to engine house with repair facilities at Huntington, Ore., to cost $30,000 with equipment.

M. J. Grewe, 1800 East Forty-sixth Street, Denver, and associates, are planning early erection of plant near Phoenix, Ariz., for manufacture of sand-lime brick, initial units to cost about $100,000 with power house, machine shop and other structures.

Western Oil Co., Los Angeles, has begun construction of new gasoline refinery in Wilmington district, to cost $2,500,000 with machinery.

General Water Heater Co., Front Street, Burbank, Cal., has awarded general contract to Union Engineering Co., Huntington Park, for two one-story additions, 60 x 175 ft., and 46 x 82 ft., to cost about $40,000 with equipment.

Canada

TORONTO, July 29.—While small individual orders are responsible for the greater part of current demand for machine tools, business as a whole is in satisfactory volume. Inquiries continue good and new business appearing is sufficient to indicate that the season will show a new record in sales compared with that of other years. Demand is not confined to any one district, but appears to be general throughout Canada.

H. G. Acres & Co., Ltd., consulting engineer, Niagara Falls, Ont., has been commissioned to rebuild the municipal hydroelectric plant at Edmundston, N. B., at a cost of $300,000. Bids for construction and equipment will be called soon.

Progress Spring Bed Co., Ltd., 988 Debullion Street, Montreal, will soon call for tenders for a five-story factory. M. E. Coshof, 1237 Phillips Square, is architect.

Bakelite Corporation of Canada, Ltd., 163 Dufferin Street, Toronto, has purchased site at St. Catharines, Ont., and will erect a plant.

Building Repairs & Alterations, Ltd., Royal Bank Building, Toronto, will build a two-story factory, 50 x 80 ft.

Several building contracts have been awarded for construction of a roundhouse and repair shops, for Toronto, Hamilton & Buffalo Railway Co., James and Hunter Streets, Hamilton, Ont., to cost $500,000.

Chrysler Corporation of Canada, Ltd., Walkerville, Ont., which recently completed erection of its main building and first of a series of three units of its plant at a cost of $1,750,000, will now erect an administration building and other units.

Canadian Industries, Ltd., will erect a sulphuric acid plant near International Nickel Co.'s refinery at Copper Cliff, Ont. Sulphur fumes from nickel plant will be used in manufacture of sulphuric acid, nitre cake, and other chemicals. It is proposed to start work next fall.

Western Canada

Westminster Paper Co.'s plant at New Westminster, B. C., was destroyed by fire, with a loss estimated at $1,000,000.

Canadian Brown Steel Tank Co., is contemplating erection of a plant at 20th Street and Pacific Avenue, Brandon, Man.

Carter-Halls-Aldinger, Ltd., Royal Bank Building, Winnipeg, has general contract for an addition to paper plant at LaVerandrye and St. Jeane Streets, Winnipeg.

Foreign

PLANS have been aproved by Otis Elevator Co., Eleventh Avenue and Twenty-sixth Street, New York, for branch plant at Sydney, Australia, including facilities for parts production and assembling, to cost more than $500,000 with equipment.

Intercontinents Power Co., operated under management of Gannett, Seelye & Fleming, Inc., 602 North Second Street, Harrisburg, Pa., engineer, with electric light and power utilities in Argentina, Brazil and Chile, known as S.A. Cia Sud Americana de Servicios Publicos, and S. A. Luz Electrica de Tres Arroyos, is disposing of a bond issue of $3,000,000, part of fund to be used for acquisition of additional properties, and extensions in power plants and system.

H. S. Denny, president, Mentor Exploration & Development Co., Ltd., Toronto, and other officials of that company are organizing Canadian Salvador Mines, Ltd., a subsidiary, to take over and operate gold and silver mining properties of Central American Mines, Ltd., in Republic of Salvador. New organization will carry out expansion program, including installation of mining and surface equipment.

Kolster Radio Corporation, 200 Mount Pleasant Avenue, Newark, N. J., operating Kolster-Brandes, Ltd., London, England, manufacturer of radio sets and equipment, has completed an agreement between last-noted organization and Telephon-fabrik Berliner Aktiengesellschaft, Berlin, Germany, for a consolidation of interests in that country. Latter company will manufacture Kolster-Brandes radios and equipment at Berlin and Hanover plants.

Goodyear Tire & Rubber Co., Akron, Ohio, is reported planning new plant in Argentina, for manufacture of automobile tires and tubes, to cost over $1,000,000 with machinery. Charles A. Stillman, vice-president, recently visited country noted to make survey and complete arrangements.

Royal Dutch Co., London, England, operating oil properties and refineries in different parts of world, is planning construction of new refinery near Budapest, Austria, to cost over $1,000,000 with equipment. It will be operated by Batavian Petroleum Co., a subsidiary.

It was doubtless apparent to all readers of the article entitled "Trouble Shooting With Microscopes," by Messrs. Smith and Riggan, THE IRON AGE, July 18, page 146, that Figs. 1 and 2 were transposed. The text makes it clear that the coarse grained structure shown in Fig. 2 is characteristic of steel castings as cast, while the fine grain of Fig. 1 represents the same after a proper anneal.